PCM

March 1984 $3

Vol. I No. 9

THE PORTABLE COMPUTING MAGAZINE

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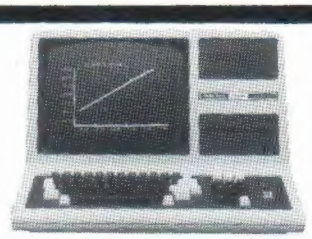

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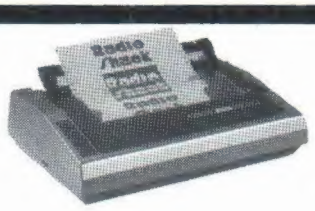

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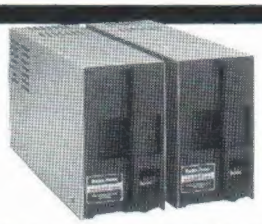

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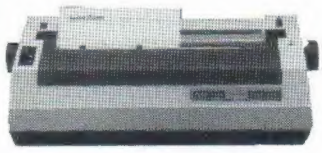

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New RS Interface . . .

'One Single Great Step'

You've been reading for a number of months now how impressed I am with the Model 100. I firmly believe that Radio Shack has really broken some very important and significant new ground with the advent of the Portable. As the months go by, this becomes more and more evident as the software market begins to grow and expand.

But now it is a hardware item which makes the one single great step for the Portable Computer. I am, of course, talking about the disk and monitor interface which graces this month's cover of *PCM*.

We, quite naturally, have done a great deal of research into the Portable Computer market and have spoken with a large number of people who either own a Portable Computer or who are working with one. Two general themes seem to be emerging from these discussions and research and I would like to share them with you.

First of all, it seems that a large number of the Portable Computers which have been sold to date are going to companies rather than to individuals. Now, I certainly am not knocking companies for recognizing the value of a Portable Computer for their employees. Why, we use them here, too, for things other than those directly connected with the publication of the magazine.

But, more and more, I see the Portable getting into the hands of people who will use them — as opposed to people who want to program with them. Oh, yes, there are a number of excellent programmers working on the Portable, as evidenced by the fine programs you are able to see in this magazine — either as listings themselves, or as programs you can buy. But the sheer proportion — especially at this early stage — of users to hobbyists (or hackers) is relatively small. And, one of the reasons seems to be the large number of companies which are buying Portables.

The second theme I see emerging is that the Portable is being used strictly as a Portable by a great many people. Once a user gets back to his or her home base, that person tends to "dump" information back into another computer. And, despite the fact that the Portable's screen is the largest in terms of display in the industry, the main reason for this seems to be an effort to get a "full" screen of information from what is in the Portable's memory.

The advent of Radio Shack's disk and monitor interface means that, for the first time, a user can really have the best of both worlds. He or she has the portability of the Portable and the screen display of a monitor coupled with the fast storage of a disk drive. That's a big bonus, indeed.

But what to my mind is even more significant is that now, for the first time, there is no hassle getting all the excellent programs which are available for the Portable to run in the larger display format. Certainly, some of them have been formatted for a 40-column display, but changing them will be an easy task for the people who wrote them in the first place. In fact, I see you having the ability to toggle between Portable and monitor displays.

One of the small problems we have found here has been the one associated with transferring information from Portable programs onto a screen which is somewhat larger — in other words, another computer. Now that is no longer a problem — and, as our cover shows, whole new vistas open up for the Portable.

For instance, a salesman can, indeed, keep track of his expenses on the road, but still save them to disk when he is back home and go over them on a full screen before printing. A writer can write while away from his desk, but "see" full pages on a big monitor screen before printing his final version. The possibilities seem unlimited.

In short, I think the additon of one simple piece of hardware — plus the advent of bar code readers from several firms — makes the Portable Computer a far more valuable tool than it has been. And I have been impressed with it all along. Our hat is off to Radio Shack for what we consider an outstanding development which will greatly enhance the usefulness of an already fine product.

— Lonnie Falk

Letters

APPENDING A CORRECTION

Editor:

I have a comment with regard to the article "Appending PoCo Files" by Ronald Paludan which you published on Page 24 of the November issue of PCM. Mr. Paludan seems to have reinvented the wheel. What he is trying to accomplish here is easily accomplished using the CUT and PASTE keys of the Model 100. I tried Mr. Paludan's program and couldn't seem to make it work. It must have been my fault because I can't imagine you publishing an untried program.

Robert E. Mosher
Royal Oak, MI

Editor's Note: There is an error in line 10 of Mr. Paludan's program, and not in your typing. As you may be aware our submissions are received on tape, loaded into our Model 100s and run before we decide to consider them for publication in PCM. *Then our programs are evaluated by technical assistants. During our early days we had to type the programs for typesetting and then proof them. We goofed on this one. To prevent this from happening we now dump the programs from the Model 100 directly to the typesetter. This should reduce the errors in our programs and text. To correct Mr. Paludan's program, make line 10 read:*

10 CLEAR500:MAXFILES=2: INPUT"FIRST FILE";F1$: INPUT"SECOND FILE";F2$: F1$="RAM:"+F1$

There are several methods for appending programs. CUT and PASTE work well, but you do have to enter both programs as ASCII files, go into the EDIT mode, and return. Mr. Paludan's program saves a few keystrokes. Also see PCM, *February, for a similar technique.*

AIR PRESSURE

Editor:

I appreciate coverage regarding the use of the Model 100 by airline passengers. Not only does it allow your readers to be informed of activity in this area but it also allows them to apply pressure when it is needed to change the minds of the "powers that be."

I would like to add a comment, however, regarding Jim Hawk's article in the January issue of *PCM*, "News From SCPIADCA." His last paragraph informed us of the use of the Grid "Compass" aboard the Columbia space shuttle. The last statement of that paragraph was, "If NASA can do portable computing on the shuttle, it would seem that we earth-bound airline passengers shouldn't have too much to worry about." Let me suggest that that statement is somewhat presumptuous. The successful and incident-free operation of the Grid "Compass" in the shuttle gives no assurance that operation of the same computer in a civil aircraft will be free of incidents of interference.

There are several important differences between civil and military air/space craft. Of interest here are two areas of concern; reliability and resistance to radio interference. The item of concern in both these areas is the difference between "inconvenience" to an airline customer and the possibly fatal interference with the proper operation of the weapon system/life support system of the military air/space craft. Because of these concerns, an enormous number of engineering hours are dedicated to the design and testing of reliable and interference-free circuits and systems in the military air/space craft as compared to the civil aircraft. The result of this increased effort in the design and fabrication of military air/space craft is radio and control systems which are more reliable and less susceptible to interference by incidental "radio" energy than the same or similar systems in civil aircraft. This is to say that a source of incidental interference in the vicinity of a military air/space craft (or, in this instance, within the craft) is less likely to cause interference to the craft systems than the same source of incidental interference within or in the vicinity of a civil aircraft.

Please be assured that this is not to imply that a careless attitude is taken toward the design and installation of electronic equipment in civil aircraft. The Radio Technical Commission For Aeronautics provides expert guidance in assuring that the safety and well-being of the airline passenger is adequately protected. Having served with that august group and in the technical discipline of radio interference, I can attest to that fact. The history of safety in the commercial aircraft industry bears witness to the effectiveness of the rules, regulations and testing requirements developed and recommended by this group.

F.W. Harland
Wichita, KS

ANY WHIZ KIDS?

Editor:

Any of your electronic whiz kids know the answer to this one? Is there any possibility that a joystick could be designed to input information through the bar code reader plug? It'd be a boon to the game writers, eh?

Best of luck with the publication.

Tony Asher
Encino, CA

KEEPING TABS ON THE PROBLEM

Editor:

Not very long ago, I built a data file on the Model 100 using the tab key throughout the file. This went fairly well, only using a few tab positions which fit my data file. After finishing the data file, I began writing the program which would input a line at a time, then applying string functions, breaking the line into several substrings for use in compiling and printing data.

The problem was apparent immediately. My use of string functions was not working — but why? I had counted and spotted positions of data fields in my file over and over again. After the loss of several fingernails, this weekend programmer finally figured it out. The TAB occupies only one character position in the string . . . whew, what a relief. But the problem actually had just begun. How do I fix my data file so that it can be analyzed with string functions? Some spaces in my file were created by TAB while others by the space bar.

After "hacking" at this for a good length of time, the program listed was my solution.

```
10 'TAB STRIP 1/13/84 REV
20 CLS
30 PRINT@45,::LINEINPUT"FILE
TO STRIP TABS: ";FF$
40 OPENFF$FORINPUTAS1
50 OPEN"STRPED.DO"FOROUTPUTA
S2
60 IFEOF(1)THENCLOSE:BEEP:EN
D
70 LINEINPUT#1,A$
80 I=INSTR(1,A$,CHR$(9))
90 IFI=0THEN140
100 MID$(A$,I)=" "
110 FORX=9TO73STEP8
120 IFI<XTHENA$=LEFT$(A$,I-1
+RIGHT$(A$,LEN(A$)-I):GOTO80
)+SPACE$(X-I)
130 NEXTX
140 PRINT#2,A$
150 GOTO60
```

This routine can, of course, be used within a program or on its own to rebuild a file replacing tabs with spaces. I recommend the former. Even though running time is lengthened, the spaces replacing the tabs will make your data file longer.

I still have one unresolved question concerning use of TABs. Has anyone knowledge of how the Model 100 preset tab positions can be changed? If there is someone with the answer to this, I would like to see it in your magazine, or please drop me a line.

Mel Perkins
Oklahoma City, OK

QUESTIONS AND ANSWERS

Editor:

Congratulations on *PCM* — a highly useful publication.

Questions/suggestions:(1) is it possible to program commands for the cursor, such as to skip repeatedly over 30 lines of a long text? Or otherwise scroll up and down through a text more rapidly? (2) And how about a one-word deletion command? (3) Could you encourage or publicize creation of local Model 100 user groups? Help is especially important for interfacing with more powerful non-Radio Shack machines. I would be pleased to learn of anyone interfacing with HP 125, 150, and 9000 machines. Or (4) how about a small portable case for only the Model 100 — about $^2/_3$ size of the Radio Shack model, and thinner, but still as sturdy.

Terry Nichols Clark
Chicago, IL

Editor's Note: Thank you for the suggestions. We at PCM *are more than happy to publish user group information if you would forward the information to* PCM. *We agree that many of us need the feedback from each other to learn to use our computers to their fullest advantage. If you have little tidbits of information that would be useful, we will gladly accept them, and if we publish them in* PCM *we will also pay you for the use of your programs and information.*

The best answer for your first and second questions at this time is that to move the cursor there are several methods built in to the computer. To rapidly move from one line to the next, the arrow keys when held down will scroll repeatedly in each of the four directions. An easier way also is to use the FIND key to locate removable code numbers or imbedded CTRL codes (see Page 60 of the Model 100 manual). The advantage of using imbedded codes is that they will not show up in the printer copy. Also there are several CTRL codes which allow fairly rapid movement of the cursor, primarily to the text which appears on the screen.

The last two questions, we will leave to the readers for their help.

CHANGER CHANGES

Editor:

I tried Larry Randall's number changer (December *PCM*) and it immediately came to grief dealing with strings of commas in ON KEY statements. The enclosed program listing corrects that difficulty, and a second problem as well: the published program inserts an unnecessary space before each line number — no problem for M100's BASIC compiler, but RENUM just couldn't handle it if you wanted again to renumber the listing. My revision eliminates the space.

I've tightened it up a little by using a few subroutines for repetitive functions, and incorporate M100's FILES command to give the user a menu of options. Finally, in a show of confidence, my listing kills the old file and renames the new one in its place — I find it gets cluttered and leaves an opportunity for errors when a number of versions of the same program are active in memory at the same time.

Rod Russell
Vancouver, B.C.

(Rod Russell's revision of Larry Roudall's number changer program is listed below.)

```
0 'L.Randall, PCM Dec '83
2 'Revised R.Russell, Jan '84
4 CLEAR1000
    :MAXFILES=2
    :DEFINTA-Z
    :GOTO12
6 GOSUB8
    :IFT$=" "ORT$=","THENX=X+1
    :GOTO6ELSERETURN
8 T$=MID$(A$,X,1)
    :RETURN
10 OPENFN$FORINPUTAS1
    :RETURN
12 CLS
    :FORI=1TO6
    :READA$(I)
    :NEXT
    :DATAGOTO,GOSUB,RESTORE,THEN,ELSE,RESUME
14 FILES
    :INPUT"File name to be renumbered: ";FN$
    :IFLEFT$(RIGHT$(FN$,3),1)<>"."THENFN$=FN$+".DO"
16 GOSUB10
    :D=1
18 IFEOF(1)THENCLOSE
    :GOTO20ELSELINEINPUT#1,A$
    :D=D+1
    :GOTO18
20 D=D-2
    :DIMA(D,1)
    :OPENFN$FORINPUTAS1
22 INPUT"First line number desired: ";N
24 INPUT"Line increment desired: ";I
    :N=N-I
    :FORK=0TOD
    :LINEINPUT#1,A$
    :N=N+I
26 A(K,0)=VAL(LEFT$(A$,5))
    :A(K,1)=N
    :NEXT
28 CLOSE
    :GOSUB10
    :OPEN"NEW.DO"FOROUTPUTAS2
    :FORK=0TOD
    :CLS
30 PRINT@50,"Renumbering"
    :LINEINPUT#1,A$
    :L2=LEN(STR$(VAL(LEFT$(A$,5))))
    :A$=MID$(STR$(A(K,1)),2)+MID$(A$,L2)
    :L=LEN(A$)
32 FORS=1TO6
    :X=1
34 X=INSTR(X,A$,A$(S))
    :IFX=0THEN44
36 X=X+LEN(A$(S))
38 GOSUB6
40 GOSUB8
    :IFT$<"0"ORT$>"9"THEN34ELSEGOSUB48
42 IFX<LTHEN34
44 NEXT
    :PRINT#2,A$
    :NEXT
    :BEEP
    :CLS
    :BEEP
    :PRINT@95,"Complete"
    :KILLFN$
    :NAME"NEW.DO"ASFN$
    :END
46 GOSUB6
48 L=LEN(A$)
    :A2=VAL(MID$(A$,X,5))
    :A2$=STR$(A2)
    :A2$=MID$(A2$,2)
    :L2=LEN(A2$)
    :C=-1
50 C=C+1
    :IFC>DTHENSOUND8000,80
    :PRINTA$
    :PRINTTAB(X-1);"^"
    :PRINT"Undefined line number"
    :KILL"NEW.DO"
    :END
52 IFA2=A(C,0)THENA3$=STR$(A(C,1))ELSE50
54 A$=MID$(A$,1,X-1)+MID$(A3$,2)+MID$(A$,X+L2,L)
56 X=X+LEN(A3$)-1
58 GOSUB8
    :IFT$=" "ORT$=","THEN46ELSERETURN
```

Gaining Sophistication In Printing Techniques

By Richard A. White
PCM Contributing Editor

As you advance to the more complicated programs that are giving more data to the user and requesting more in return, you will feel a need to clean up the screen. Things like words cut in half at the right edge will hopefully already have been conquered. Now, let's say you are working on man's most prolific program, the one that balances the checkbook. It sure would be nice to start at the left margin with the check number, and then on the same line enter the date, and still on the same line enter the amount, etc. And while we are at it, if the amount entry is 21.35, let's reprint it right now as $ 21.35 so it lines up neatly with the entry for the check before that was reprinted as $1872.99. Consider these entries to be in a publisher's checkbook and not in the impoverished author's.

And while you are at it, how about getting a neatly formatted check listing off the printer for comparison with the bank statement that just came? Sound tough for a beginner? Well it does take some learning, but what doesn't? Everything needed is in M100 BASIC.

It took me some time and not a little sweat to learn how to format the screen. But when the printer came, I found that most of what I knew about printing to the screen worked on the printer with only modest differences. One does not PRINT@150, to a printer. Likewise, the printer line may range from 32 to 132 or more characters depending on your printer. But, these differences are not a problem once you are aware of them.

Print position control lies at the heart of print formatting. PRINT causes the first character to be printed at the current print position. There is an analogous position on a line at the printer. When printing, you don't see the cursor moving, but you can think of it as doing so. When printing is complete, where is the print position? If you do nothing to control it, it will go to the first character position on the next line on the screen. Most (not all) printers advance to the next line on the page.

At the risk of breaking the flow, be aware that some printers need to be sent a line feed character CHR$(10) since they will not automatically line feed after a carriage return. Fortunately, these are a small minority. But, if some guy catches you in an alley and offers to sell you a QPGZY 6.5 character per second typesetter and billboard painter for $100, know that you have been warned. Know also that some printers (including some Radio Shack models) will do an automatic line feed if they do not get a carriage return within about one second after the last character is received. This is generally not a problem, but I would not call it a feature, either.

Dick White has been programming in BASIC *for over three years, and has a number of programs on the market for the Color Computer. He is also a columnist for* ***the Rainbow, PCM's*** *sister publication, and is a member of CINTUG, the Cincinnati TRS-80 Users' Group.*

BASIC provides two cursor control characters, the semicolon ";" and the comma ",". A semicolon immediately following a string in a PRINT statement will suppress the carriage return and hold the print positon at the location immediately following the last printed character of the string. What about numbers? a printed number is sent as a string of characters to either the screen or the printer. So, it makes no difference what is in you PRINT or LPRINT statements, if the last character is a ";" the next print positon will be immediately following the last character printed.

If you use a "," in place of the ";" the print position will be tabbed to the beginning of the next "print zone." The default value of a print zone is 14 characters. However, there is only one print zone position per line, at position 14 when printing to the screen. LPRINT is not so restricted, and each comma will move the printer print position to the next tab position which will be some multiple of 14.

I use the comma when printing menus on the screen. Try the following code.

```
10 CLS :PRINT :PRINT :PRINT
   " 1 FIRST MENU CHOICE",
   " 2 SECOND MENU CHOICE"
   ,,," 3 THIRD MENU CHOICE"
```

Since each string ends past position 14 on the screen line, the comma causes a carriage return and starts the next string on a new line. The three commas after " 2 SECOND MENU CHOICE" causes the print position to move to the next line, then to the 15th character position and then to the second line down. This is a neat way to double space text with minimum typing. If your text ends before position 14, you will need an extra comma.

You can use the print zones to set up tables of equal width columns on your printer fairly easily.

```
10 FOR X=1 TO 4 :LPRINT" "
   :NEXT :LPRINT" ","COLUMN
   1","COLUMN 2","COLUMN 3"
   ,"COLUMN 4","COLUMN 5"
15 LPRINT STRING$ (80,"-") :
   LPRINT" "
20 FOR X=1 TO 20 :LPRINT
   ST$(X), :FOR Y=1 TO 5 :
   LPRINT VL(X,Y), :NEXT :
   LPRINT" " :NEXT
```

This code will print four blank lines, then 14 spaces and then the headings COLUMN 1 through COLUMN 5 at 14-space increments. In line 15, we dress things up with a row of dashes and a blank line. Line 20 prints a 20-line by five-column array of numbers with an identifier, ST$(X), for each row in column 1. We discussed arrays last month and showed one example of their power and ease of use. Here is another area where arrays accomplish a goodly bit of work with minimum code.

"PRINT USING works from your keyboard as well as from a BASIC program, so fire up the M100 and get some action along with the reading."

Since we can get only two columns on the screen using the comma width field, we need a different tool to get more columns. TAB() to the rescue. PRINT TAB(20)X tells BASIC to print X starting at the 20th position on the line. LPRINT TAB(20)X is the equivalent statement for the printer.

PRINT@ X is only usable when printing to the screen. It is used to set the print location to any position on the screen directly. Even if your cursor is in line 6, you can print at the top left of the screen by using PRINT@0, "XYZ"; without otherwise changing what is on the screen. Screen positions are numbered sequentially starting at 0 and going to 319. The end of line one is 39, the start of line two is 40, etc. There are screen numbering diagrams in your manual that are garbage. Unfortunately, the only mention of PRINT@ that I could find was on the PRINT@ worksheet, Page 210, which is totally misleading. The table below should help clear up the issue.

PRINT @ POSITION

LINE NUMBER	LEFT EDGE	CENTER	RIGHT EDGE
0	0	20	39
1	40	60	79
2	80	100	119
3	120	140	159
4	160	180	199
5	200	220	239
6	240	260	279
7	280	300	319

Here is a short program to demonstrate PRINT@.

```
10CLS :FORX=0 TO 310 STEP 10
 :PRINT@ X, X :NEXT
20 GOTO 20
```

This only works right when the label function is turned off. The labels are printed in line 7. When they are showing, anything printed to line 7 locations is printed on line 6. If you turn the labels on and RUN the program, it will look almost right. Look closely and you will see that numbers which should be on line 7 have written over line 6.

Remember that the ";" holds the print position at the end of the last character printed and affords no opportunity for the screen to scroll. This works to our advantage since it keeps the numbers at their proper print positions. Try the program with the ";" after the X is removed and watch it go to pot.

```
10 CLS :FORX=0 TO 310 STEP 10
   :PRINT@ X, X :NEXT
20 GOTO 20
```

It is good practice to use the ";" with your PRINT @ X, statements so you always have full control of the screen position.

The INPUT and LINEINPUT statements are a pain since they always send a carriage return when you hit ENTER to complete the data entry. Say you wanted to enter data at a number of locations on the same line on a form that you had previously printed on the screen. Some data management programs allow the user to make up a form that displays on the screen with blank areas where data is to be entered. Say that field three wants a two-character number to be entered at line positions eight and nine on line 5 while field four needs up to 10 characters entered starting at line position 21 on line 5. As soon as the number is entered using INPUT, the remainder

of line 5 is wiped out including the name for field four and the new print position ends up at the beginning of line 6. INKEY$ gives us a tool to do it right, but there will need to be more than just an A$=INKEY$ statement to make it work. Let's develop a general INKEY$ subroutine that can be used in place of INPUT and LINEINPUT and which will provide some performance features those commands lack.

Let's think about what those features might be. This is really writing a specification of what we want.

1. Have an option to limit the number of characters to be entered.
2. Print each character as it is typed.
3. Test for a carriage return to terminate data entry, but leave the print position where it is.
4. Automatically terminate data entry when the specified limit is reached.
5. Return a string. The string can be easily converted to a number if a number was to be entered. You can even build in a test to be sure that only numerals or a period are entered if a number is expected.

We will need some variables to carry information to and from the subroutine and for intermediate storage within the subroutine. Let's send the character count limit in LM. Within the subroutine, A$ will be a temporary storage variable and CT will be the character count variable. B$ will carry the resultant string back to the calling routine. Below is the subroutine.

```
10 B$=STRING$(LM,32) :CT=1
12 A$=INKEY$ :IF A$<>CHR$
   (13) THEN PRINT A$; :MID$
   (B$,CT,1) =A$ :CT=CT+1 :IF
   CT<LM THEN 12
14 RETURN
```

This subroutine is really a substitute for LINEINPUT with the additional features described above. On entry in line 10, B$ is defined as a string of spaces LM long. Be sure to give LM some value before calling the subroutine. The count variable is set to 1. A character is obtained in A$ and checked to be sure it is not a carriage return (CHR$(13)). If it is, the program goes to line 14 for the RETURN. Otherwise, A$ is printed with the ";" to hold the print position and put into B$ with the MID$ command. This saves generation of string garbage and garbage collections delays. Finally, CT is incremented and tested. If CT=LM the program goes to 14, otherwise it goes to line 12 to get the next character. The routine will return B$ with some extra spaces whenever fewer than LM characters are entered before the carriage return. This can be corrected in the calling routine as follows:

```
GOSUB10 :B$=LEFT$(B$,CT)
```

The following subroutine also works and will use less code when memory is real tight.

```
10 B$="" :CT=1
12 A$=INKEY$ :IF A$< >CHR$
   (13) THEN PRINT A$; :B$=B$+
   A$ :CT=CT+1 :IF CT<LM
   THEN 12
14 RETURN
```

It has the merit of sending back B$, whose length is exactly the number of characters entered so B$=LEFT$(B$, CT) is unneeded. Note that in both cases, the code is written to avoid using ELSE which slows execution.

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So, let's come back to where we started, PRINTing a neat number like $ 21.35. With PRINT USING, there are a variety of formatting options dealing not only with dollars, but with other numbers and with strings. And USING can be used with both PRINT and LPRINT. USING needs two pieces of data to work. It needs to know how you want the data formatted and it needs to have the data to be output. Here is the basic syntax for outputting a number:

```
PRINT USING"#####";D
LPRINT USING"#####";D
```

D is the variable containing the number. "#####" is the format string which tells how to output the number. In this case, "#####" says "print D as an integer number with up to five digits." Here are some examples.

D	FORMATTED OUTPUT
345	345
345.89	346
23456.4	23456

Note that the output is aligned right and that the decimal part has been rounded. This is a true rounding as opposed to INT() and FIX() which do not truely round. By the way, 0.5 rounds up to 1.0 while .499999 rounds down to 0.0.

PRINT USING works from your keyboard as well as from a BASIC program, so fire up the M100 and get some action along with the reading. Type in the following:

```
D=12345.6
OK
S$="$##,###.##"
OK
```

The computer now has some data, 12345.6, and a format string (named S$) in its memory. The format string "$##,###.##" will tell PRINT USING to print a $ on the left, allow space for five integers and two digits after the decimal, print a comma when there are more than three integer digits and print a decimal with two digits to the right. Let's type:

```
PRINT USING S$;D
$12345.60
OK
```

Now try this one:

```
CLS :PRINT @125,USING$;D;
$12345.60
OK
```

This means that you can print a formatted output anywhere you want on the screen. When you use a ";" after the D you keep the cursor at the end of the last character printed as described above. To demonstrate:

```
CLS :PRINT @125,USINGS$;D;
      $12345.60
OK
```

Here are two other keyboard exercises to demonstrate PRINT USING properties. You type the lines indicated.
You Type

```
E=34.2
OK You Type PRINT USINGS$;E;D
$  34.20$12,345.6
OK
```

The computer allocated the same number of print positions for each number. The unused positions before the "3" were filled with spaces. The number of print positions is equal to the length of the format string. When it is not appropriate to print a comma, a space is substituted. But, the numbers above run together and do not make a clear printout. One solution is to provide PRINT @ XY, USING statements for each number printed. Here is another way to try from the keyboard.
You Type

```
S$="   $##,###.##"
OK You Type PRINT USINGS$;E;D
    $   34.20 $12,345.60
OK
```

Much better. Any ASCII character may preceed or follow characters and will be printed as typed in the format string.
You Type

```
S$="##,###.## PAID"
OK You Type D=243.76
OK You Type PRINT USINGS$;D
$   243.76 PAID
OK
```

There are 10 different "field specifiers," some of which can be combined to do just the format you need. They are described with examples on Pages 170 to 172 of your manual, so I will not go over them here. You can keyboard-test them just as we have done with the examples. If you are going to be doing any amount of programming, you should learn these. You'll find few handier helpers in BASIC.

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A Capital Quiz For The Worldly Computerist

By Robert Frowenfeld
PCM Contributing Editor

One of the nice things about the Model 100 is that it can be entertaining and educational as well as an invaluable business companion. And this month we are really going *On The Road* with a little game to help you and your children learn a little geography. No messing around today with the 50 states and their capitals — we're going international with a program that challenges your geographic knowledge. So relax, tell the kids that you're going to show them how they, too, can become part of the computer age with PoCo, and I'll give you the few simple instructions you need to know.

The program is called *CAPS.BA* (that's short for *Capitals*), and as usual, there's a data file that contains the names of the countries and their capitals. The data file's name is *CAPS.DO* (how terribly original of me!). After typing in the program (in BASIC) and the data file (using the built-in text editor), just type "RUN" and we're ready to go traveling!

You can play the game two ways, you can guess the capital of a country, or you can have the computer give you the capital and you have to name the country. Be sure to type in all your answers in uppercase, otherwise the program will not be able to detect a correct answer. If you answer correctly, the program will pleasantly beep at you and tell you that your answer is correct. However, if you can't figure out the right answer, PoCo will treat you with a short, and polite raspberry!

A word of warning — there are some easy country/capital combinations here, and (of course) there are a few mind bogglers too. The order in which the countries (or capitals) are displayed is random, so you won't be able to remember a pattern. So if you think this is going to be a breeze, think twice. Everybody knows the capital of France is Paris, but how about Greenland, or Mongolia, or Surinam? Good Luck!

(Robert Frowenfeld owns his own computer programming firm in Louisville, Ky., and has completed his graduate course work in computer science at the University of Louisville.)

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The listing:

```
1 CLEAR 2000:DEFINT B-T:DEFSTR A,R,U
2 BL$=STRING$(38," ")
5 ES$=CHR$(27):R=ES$+"p":U=ES$+"q":GOTO
35
6 LINEINPUT IN$:X=VAL(IN$):IF IN$<>"" TH
EN Y=ASC(IN$):RETURN ELSE RETURN
35 DIM A(100,2)
40 NC=86
50 OPEN "CAPS.DO" FOR INPUT AS 1
60 FOR I=1 TO NC:INPUT #1, A(I,1),A(I,2)
:NEXT I
70 N=VAL(RIGHT$(TIME$,2)):FOR I=1 TO N:X
=RND(1):NEXT I
100 CLS:PRINT@10,R" PCM GEOGRAPHY TUTOR
"
110 PRINT @90,R" 1 "U" CAPITALS
120 PRINT @130,R" 2 "U" COUNTRIES
130 PRINT @170,R" 3 "U" END PROGRAM";
140 PRINT @250,"Select: ";:A=INPUT$(1)
150 X=VAL(A):IF X<1 OR X>3 THEN BEEP:GOT
O 140 ELSE PRINT A;:IF X=3 THEN MENU
160 ON X GOTO 200,300
200 'capitals
210 CLS:GOSUB 400
220 PRINT @ 50,"What is the capital of
230 PRINT @130,A(N,1)" ?"
240 PRINT @210,"";:LINE INPUT A$
250 IF A$=A$(N,2) THEN MS$="Correct":GOS
UB 500 ELSE SOUND 5000,20:PRINT @ 285,"T
he correct answer is: ";A(N,2);
260 FOR I=1 TO 1500:NEXT I
270 GOSUB 600
280 IF ER=1 THEN 100 ELSE 200
300 'countries
310 CLS:GOSUB 400
320 PRINT @ 42,A(N,2);" is the capital o
f ?"
330 PRINT @ 122,"";:LINE INPUT A$
340 IF A$=A(N,1) THEN MS$="Correct":GOSU
B 500 ELSE SOUND 5000,20:PRINT @ 202,"Th
e correct answer is: ";A(N,1);
350 FOR I=1 TO 1500:NEXT I
360 GOSUB 600
370 IF ER=1 THEN 100 ELSE 300
400 N=RND(1)*NC:RETURN
500 'flash message
510 PP=300-LEN(MS$)/2
520 FOR I=1 TO 3:PRINT @ PP,R;MS$;:BEEP:
PRINT @ PP,U;MS$;:NEXT I:RETURN
530 RETURN
600 'pause
605 ER=0
610 PRINT @ 280,TAB(38);:PRINT @285,"Pre
ss any key or "R" ESC "U" to Exit ";:A=I
NPUT$(1):IF A$=CHR$(27) THEN ER=1
620 RETURN
```

Data file *(CAPS.DO)*:

```
CANADA,OTTOWA
MEXICO,"MEXICO CITY"
GUATEMALA,GUATEMALA
"EL SALVADOR","SAN SALVADOR"
HONDURAS,TEGUCIGALPA
CUBA,HAVANA
NICARAGUA,MANAGUA
"COSTA RICA","SAN JOSE"
PANAMA,PANAMA
COLUMBIA,BOGOTA
ECUADOR,QUITO
PERU,LIMA
CHILE,SANTIAGO
ARGENTINA,"BUENOS AIRES"
URUGUAY,MONTEVIDEO
BRAZIL,BRASILIA
"FALKLAND ISLANDS",STANLEY
PARAGUAY,ASUNCION
BOLIVIA,"LA PAZ"
VENEZUELA,CARACAS
GUYANA,GEORGETOWN
SURINAME,PARAMARIBO
"FRENCH GUYANA",CAYENNE
GREENLAND,GOTHAB
ICELAND,REYKJAVIK
IRELAND,DUBLIN
"UNITED KINGDOM",LONDON
FRANCE,PARIS
SPAIN,MADRID
PORTUGAL,LISBON
NETHERLANDS,AMSTERDAM
"WEST GERMANY",BONN
"EAST GERMANY",BERLIN
AUSTRIA,VIENNA
SWITZERLAND,ZURICH
ITALY,ROME
POLAND,WARSAW
HUNGARY,BUDAPEST
ROMANIA,BUCUREST
YUGOSLAVIA,BELGRAD
CZECHOSLOVAKIA,PRAGUE
NORWAY,OSLO
SWEDEN,STOCKHOLM
FINLAND,HELSINKI
TURKEY,ANKARA
RUSSIA,MOSCOW
SYRIA,DAMASCUS
LEBANON,BEIRUT
ISRAEL,"TEL AVIV"
IRAQ,BAGHDAD
IRAN,TEHRAN
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TUNISIA,TUNIS
ALGERIA,ALGIERS
LIBYA,TRIPOLI
EGYPT,CAIRO
ETHIOPIA,"ADIS ABABA"
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"NEW ZEALAND",WELLINGTON
AUSTRALIA,CANBERRA
INDIA,"NEW DELHI"
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Now that Radio Shack has introduced its new Disk/Video Interface, the Model 100 has become the latest desk-top machine, as well as a go- everywhere portable.

D/VI*

*The Interface

By Ed Ellers

This month's "LPRINT" column discusses the new Disk/Video Interface. *See Page 5.*

When Radio Shack introduced its Model 100 less than a year ago, many people wondered how long it would be before Radio Shack or someone else brought out a video display adapter and/or disk drives for it. When the first M100s fell into the hands of computer experts, they discovered that Microsoft, true to form, had designed the M100's built-in firmware to allow for easy expansion. Radio Shack has finally dropped the other shoe; the Disk/Video Interface provides both a video display (24 lines of 40 or 80 columns) and one or two disk drives for the Model 100. (The Disk/Video Interface requires at least 16K RAM.)

The D/VI unit is about 12″ wide, 5″ high and 12″ deep. Its only connections are the cable to the M100, jacks for a monitor or a TV set and the power cord; its only controls are the power switch and the channel 3/channel 4 switch. (If this seems a bit sparse compared to the multitude of connectors you see on many desktop computers, remember that the Model 100 already has jacks for a tape recorder, parallel printer, RS-232 serial port, telephone line and bar code reader. There's not a whole lot left to add!) It connects to the M100's 40-pin expansion socket (under the unmarked cover on the bottom near the front edge) with a special cable. A quick-release adapter socket is provided which lets you attach and release the D/VI's cable easily, as is a special cover that replaces the old cover when the D/VI is in use. To hook up the two units, you simply remove the expansion cover, install the adapter (which stays in the machine for good), plug in the cable and lock it down, snap on the new cover and then plug the other end of the cable into its socket on the bottom of the D/VI. When you need to disconnect the M100 for portable use, you take off the cover, unlock and remove the plug and replace the old cover.

To start up, you switch on all the usual peripherals (printer, monitor, etc.) and the computer first. When you switch on the D/VI and insert the system diskette, it loads the disk operating system into the D/VI's memory. To load Disk BASIC into the Model 100, you either switch the M100 off and on again or press the RESET button. After Disk BASIC has loaded you are ready to begin using the full system. Disk BASIC remains in the M100's RAM until you do a cold start (or the batteries and the memory's NiCd cell run down), taking up about 4500 bytes. To get that RAM back for portable use, you have to perform a cold start and wipe out all your RAM files in the process.

The Video Display

Although no suggestions are given in the manual, Radio Shack apparently recommends the $249 VM-1 Monochrome Display as a video monitor for the D/VI; it is a 12″ green-screen monitor that was recently introduced for the Model 2000. You can use just about any black-and-white, green or amber computer monitor (a color monitor probably won't work well in the 80-column mode); most of my testing was done with Leading Edge Products' Gorilla green and amber monitors, which seem to be a good match for the D/VI. If you are willing to live with a 40-column screen, you can use the D/VI with a normal TV set on channel 3 or 4 (an RF converter is built in). Results will vary depending on the condition of your TV; while I didn't test this mode extensively, I did feed the system into three different TV sets (a beat-up black-and-white portable, a friend's somewhat out-of-focus console and my fairly new 19″ RCA ColorTrak). I found that the 40-column mode worked well on all three, but that the 80-column mode suffered from the inherent weaknesses of the RF converter/home TV combination, mainly the bandwidth of the TV and (on color sets) the size and density of the stripes or dots on the picture tube faceplate. If you have a color set smaller than 21″, in fact, you can almost certainly forget about 80 columns because the tube won't be capable of the needed resolution (unless you have a very new set with a special high-resolution tube). The ability to use

---

*(Ed Ellers, a **Rainbow** and **PCM** staff member, is a self-confessed electronics fanatic whose other interests include science fiction and factual writing.)*

a normal TV set (which most business computers can't do) is a real plus because it lets you, for example, use the full system with a computer-type monitor at the office during the week, carry the M100 home at night or on trips, and then take the M100 and the D/VI home over the weekend without having to drag the monitor along.

When you go into BASIC, all output will still be seen on the Model 100's liquid-crystal display. To switch from the LCD to the video display (CRT), enter SCREEN 1. The video screen will clear and the "OK" prompt and flashing cursor will appear. When you enter WIDTH 80, the characters will go to half their former width; type WIDTH 40 and they will return to the original size. (On a 12" monitor, the 40-column characters are about the same size as the characters you see on the LCD.) When you press LABEL, the labels appear on the bottom of the CRT screen. If you are in 80-column mode you will see that the labels have been expanded to show the full command (not just the first four characters) for each function key in BASIC. Pressing F8 takes you back to the menu (on the LCD; the menu does not appear on the video display), and when you enter another application the same video mode that you selected from BASIC applies there as well. If you enter SCREEN 0 in BASIC, all output will be redirected to the LCD. It's a good idea to do this when you get ready to disconnect the M100. (The SCREEN command's original function of turning the labels on and off still applies; 0,0 gives you the LCD with no labels, 1,0 switches to CRT without labels, 0,1 selects the LCD with labels and 1,1 sets up the video display with labels.)

The video display is most helpful in *TEXT* because you can now see roughly six times as much of your document at once as you could on the LCD. *TELCOM* benefits as well since most services transmit at least 16 lines of text before pausing, and many of the more exotic systems (such as Westlaw and Dialog) use an 80-column line and don't work well at 40 columns. BASIC programs written to use the Model 100's LCD probably won't benefit much from the CRT display; on the other hand, programs written for video will likely have problems running with the LCD display, mainly because of scrolling (in many cases the program will stop with an FC Error because a PRINT @ value was out of range). *ADDRSS* and *SCHEDL*, which don't display a whole lot of text, weren't affected one way or the other in my brief tests of them.

About the only thing missing from the video section is high-resolution graphics. PSET and PRESET work only on the LCD, even if text is directed to the video display. The Disk/Video Interface would have been capable of a resolution of 640 horizontal by 200 vertical if it had used a bit-mapped display memory like the M100's LCD system uses, but it would have required 16K of video memory instead of the 4K now present and may well have caused display operation to be a lot slower.

Disk Storage

The Disk/Video Interface uses one or two 40-track disk drives, each of which can store up to 184K of data (some of which is taken up by the file directory and by DOS and Disk BASIC. The disks used are the ordinary 5¼" diskettes (for those of you who like to know *all* the parameters, they are single-sided, double-density, soft-sectored, 48 TPI and unformatted) that are used by so many computers these days.

Most computers use a file system on their disks (where all information is arranged in files made up of a series of records); many computers that are expandable to include disk drives add a great many disk file input/output commands to the existing "cassette" BASIC interpreter. Since the Model 100 already had RAM file I/O commands very much like those used for disk systems, very few new commands needed to be added. To use a disk file in place of a RAM file, you just add a "0:" to the beginning of the filename (or in place of "RAM:" when used). The M100 with Disk BASIC in place will automatically use the disk file, which will appear to your program just like a RAM file does. If you have the second drive installed, you can use ":1" to specify it instead of the first drive.

The only really new commands are DSKI$ and DSKO$, which let you read from, and write to, individual sectors on the disk (disk files are made up of a group of 256-byte sectors strung together); LOC and LOF, which return the current or highest record number of the buffer you specify; and LFILES, which gives you a listing of the files on a disk (which is roughly the same as FILES, for RAM files). LOC and LOF (aside from LFILES) are probably the most important new commands, because they let you use random-access files where any record in the file can be accessed directly. The Model 100's RAM file system is only able to use sequential-access files, which are much slower than random-access (though this is made up somewhat by the faster RAM file system). If you like (and if the available memory permits), you can even copy an entire disk file into RAM at the start of a program, work on it as a RAM file (using only sequential access, though) and then copy it back onto disk before ending the program. This capability is often called "RAMdisk" or "virtual disk" operation, and is becoming fairly popular on other computers, which require special software and often additional memory boards to do it. The Model 100 has this capability built-in.

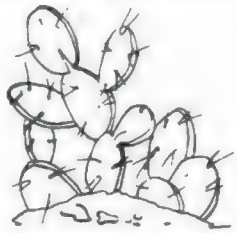
The three utility programs provided with the Disk/Video Interface are *FORMAT* (which records formatting information on a blank disk), *BACKUP* and *BACKUP.SNG* (which make backup copies of diskettes on two-drive or singledrive systems respectively). *BACKUP.SNG* requires at least 9,500 free bytes in RAM to work, so you may have to kill some RAM files before you can make a safety copy of the system diskette that comes with the D/VI. *BACKUP.SNG* required switching disks seven times to copy what was on the disk as received. (Since our test unit had only one drive, I was unable to try the two-drive *BACKUP* program.)

Future Prospects

With the Model 100 now expanded to the level of a "normal" desktop computer with disk drives and a full video display, what do we now have? The one thing we don't have is the ability to run all those "standard" business programs. The 100 wasn't designed to go head-to-head with the rest of the desktop computers on the market. Consider this, though: We now have a full-fledged business computer; one with a reasonable amount of disk storage, a first-rate video character display, and an easy-to-use menu-driven operating system. The machine has connections for a parallel printer, RS-232 serial communication, tape recorder, a built-in modem and can even use a bar code reader. It comes with applications programs for word processing, telecommunications and personal filing. And after all this, you can detach the computer from the expansion box and use it outside the office!

The Disk/Video Interface, while it does not make the Model 100 into the same sort of computer as the Model 12, gives the M100 useful capabilities that it did not have before and expands the M100's usefulness to the business or personal user. It should open up new uses for the already unique Model 100.

PCM



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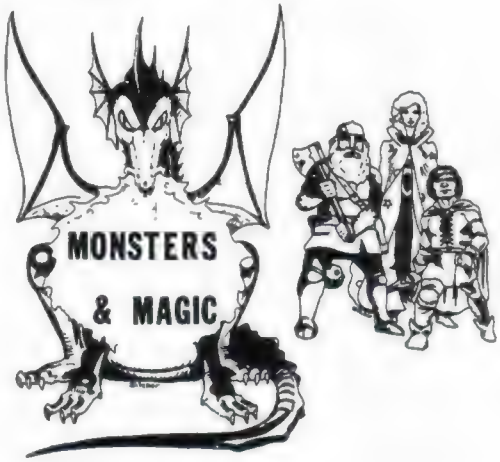

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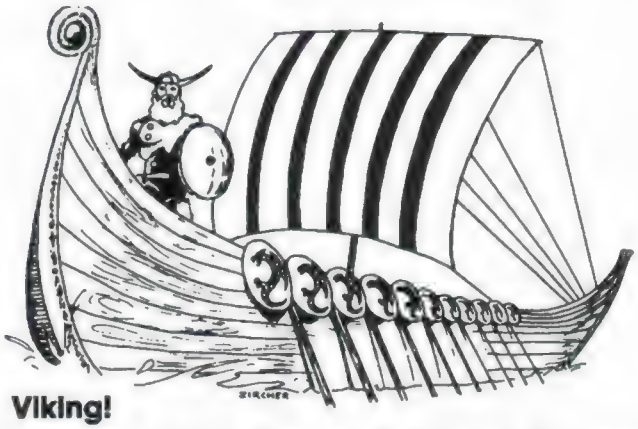

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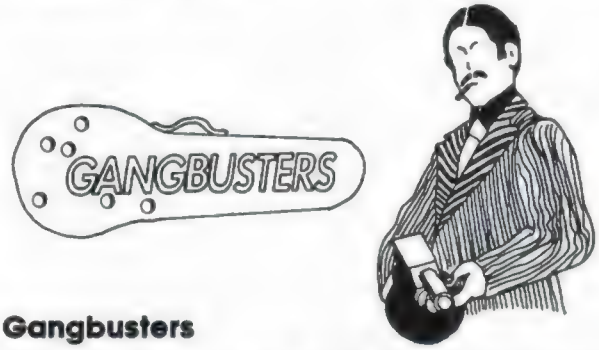

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Travels With PoCo: Personal discoveries along the way

By Jim Hawk
PCM Contributing Editor

The following tips are mainly intended for those who may be new to the Model 100 and *Portable Computing Magazine*. But even a few of you "old-timers" may find something useful — no one outside Tandy has more than a year's experience on the machine. These ideas were gleaned from my own first-year love affair with the M100, my various conversations with Tandy officials and from careful rereading of the manual to dig for hidden nuggets of knowledge.

Do-It-Yourself Function Keys

The inescapable fact that Model 100 memory is limited makes us all "killers" . . . file killers. Having to dispose of files daily, I wondered "why didn't Tandy make one of the BASIC function keys a 'kill' command?" It turns out they left it up to the individual. Six of the eight function keys in BASIC are normally accounted for: File, Load, Save, Run, List and Menu (although they, too, can be redefined, if necessary). But that leaves the F6 and F7 keys that, with a simple one-line command, will let you call up whatever needed (within the limits of BASIC and 15 characters). For example, to make the vacant key 6 represent the KILL command followed by the necessary quotation marks, you simply go to BASIC and type in:

```
KEY6, "Kill" + CHR$(34)
```

The BASIC interpreter reads KEY as meaning "define a function key." The number 6 designates the sixth function key. Kill, enclosed in quotes and preceded by a comma, is what will appear at the cursor when you press F6. And, the plus sign followed by CHR$(34) tells your M100 to add a quotation mark after it prints Kill. The CHR$ function gives you the ASCII character specified by the number in the parentheses (you get the numbers from the "Decimal" column of the ASCII Character Code Tables on Pages 211-216 of the manual). Now, with your new F6 Kill key, just press a single button whenever files need to be disposed of, and type in the file name normally. Even easier, and just as useful I've found, you can turn F7 into a PRINT command:

```
KEY 7, "Print"
```

(Jim Hawk has been working in radio news for the past 12 years and has a science and electronics background. He also does freelance writing in Washington, D.C.)

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Note that just the first letter of the BASIC keyword PRINT has been capitalized — this is simply for aesthetics, since all the other function keys have only the first letter capitalized when you press the "LABEL" key. It really doesn't matter, since the BASIC interpreter makes no distinction between upper- and lowercase. Another function key idea would be to designate F6 or F7 to give you the time of day while you're in BASIC:

```
Key 6,"?TIME$" + CHR$(13)
```

This is an interesting example because it points out the fact that the "?" can be used as a shortened version of PRINT, and that adding a carriage-return CHR $(13) is the same as hitting the ENTER key. That's how the "Run" key, F4, works — if you wanted to assign the same function to F8, you'd enter:

```
Key 8,"Run" + CHR$(13)
```

The possibilities are only contained to your imagination (and that 15-character limit). And if you have a long BASIC program to type in, all eight keys could be made to stand for a different commonly called-for BASIC keyword. The only trouble comes when you want to change the function keys back to their original designations — you get into those mysterious "machine level subroutines." Actually, it's not all that difficult — it just takes two entries, as follows:

```
CALL 23164,0,23366
CALL 27795
```

Suffice it to say it works — basically, those numbers stand for memory addresses of the built-in software, which contain the so-called "cold start default" information. Those two lines tell the BASIC to reset to its normal parameters, including the function keys. One note if you own M100 software that requires a machine language subroutine — the BASIC program that goes with it may contain those very same CALL commands at the end of the program, and you'll find your function key definitions disappear. This happened with *WRITE+* from Portable Computer Support Group, but programmer Michael Stanford assured me there is a fix — namely eliminating that line (call PCSG for details).

A Built-in Calculator

I hate to admit how many times I had my 100 with me, yet sat at my desk adding my checkbook by hand because I thought I didn't have a calculator with me. It turns out the 100 is a super-accurate calculator . . . accurate to 14 digits! Remember that F7 "Print" key we spoke of? Just hit that, type in your problem and hit ENTER — the answer is returned on the next line. Or just type "?" and your problem: a question mark serves as an abbreviation for the word PRINT, but I prefer having a dedicated function key (don't have to press the Shift key to get to uppercase). The drawback to this so-called immediate mode is that when you want to add or subtract from the last entry — like balancing a checkbook — you need to reenter the new balance each time. One nice feature of the immediate mode is that it doesn't disrupt the program currently in BASIC. And if you're waiting at the airport creating a BASIC program, you can program one of the function keys for time (as outlined above) and not have to leave BASIC and go back to the menu just to find out the time.

Mailing Labels

It's funny how simple solutions can emerge from seemingly complex problems. I bought a box of single-wide mailing labels the same day I got my DMP-120 printer. But I didn't know how to get the printer to type addresses where I wanted them. A friend gave me a printout of a mailing label program that must have had a couple hundred lines. I'm no lover of keyboard entry, so I experimented. Pure simplicity itself was the answer . . . just type your first entry normally, using three to five lines for the address but making the entire block six lines total using an extra carriage return or two. That's because each mailing label holds five lines and the sixth is for the small space in between labels. Continue this method for as many six-line entries as you have, then line up your printer head with the top of the first usable mailing label and hit Print. You can check whether you've got the correct number of empty lines between labels by going to the top of the file, then holding down the Shift key and going through the file "page by page" using the down-arrow cursor key. If each entry is six lines, you'll see your addresses jump up a line each time the cursor jumps to the bottom of the display. As long as each address conforms to the six-line rule and the printer's tractor feed mechanism is up to par, those labels come out perfectly! Since your file is in text, editing can be done in the usual Cut and Paste method.

***TELCOM* Tips**

If you subscribe to one or more information services, you've probably entered the auto log-on procedure into your address file. And it works fine for the direct-connect modem cable. But what if you go out and purchase the acoustic coupler so you can hit the road and still keep in touch? The manual specifically states that "the auto-dialing function is not available when the Acoustic Coupler is used." It makes no mention of auto-log on, but you'd get the impression that wouldn't work, either. I decided to experiment and found that while the auto-dial indeed didn't work with the acoustic cups, I could manually dial the number and hit the Call function key in *TELCOM* mode simultaneously (after, of course, finding the number to call). The 100 dutifully clicked its little dialer relay as the seven phone number digits appeared, and went right into terminal mode and signed me on to CompuServe just like the direct-connect modem cable. There is a trick in timing it right — if you hit Call too soon, it'll finish dialing before the actual connection is made and won't get the carrier tone it's waiting for. I've found the timing easier to do if the dialing speed is in the fast mode (20 pulses per second). This can be easily changed by pressing the Stat function key, F3, entering the five parameters as usual but then adding a comma and either 10 (for the slower dialing speed) or 20 to cut in half the time it takes to dial.

Speaking of those Stat parameters, I found it far too easy to forget to change them when going from Dow Jones to CompuServe. One service requires "M71IE" while the other needs "M71ID." The solution for me was to write a Stat reminder in the address file before the auto-dial, auto log-on procedure. So, when I have *TELCOM* find CompuServe, it pops up with "CompuServe (Stat M71IE) :" and then the phone number. Most of the time it works, although I'm sure the next-generation M100 version will change communications parameters automatically. There is a slightly annoying bug in *TELCOM* — the tendency to occasionally skip ahead one year on the calendar after a session with some of the "electronic bulletin boards." I was blaming cosmic rays or gremlins, but this mysterious date change apparently comes from the Read Only Memory. It'd take a computer expert to explain just what happens and still probably wouldn't make sense. Fixing the year-change is easy — just go to BASIC and type:

```
Date$ = "##/##/##"
```

Just be aware that you're not alone if you've been time-machined into the next year . . . and notice it only seems to happen after a good session with an information service. A very small machine language program would be one solution, and I'd guess it might appear on the Model 200 (dare I suggest?).

The Paste Problem

The Model 100 never forgets, and that can be both a blessing and a curse. If you accidentally press "Cut" instead of "Copy" after selecting a block of text, you can simply press the Paste key to get it back. But the paste buffer holds whatever was last dumped into it, and accidentally hitting that key can wreak havoc. For example, hitting Paste with just the menu appearing will dump the buffer into that "Select" window at the bottom left, with the 100 beeping every six characters. Pressing "Shift-Break" stops the process, but there's another way to avoid an occurrence in the first place. Just make a habit of clearing the Paste buffer of unwanted material (and bytes) by going to any text file, then tap F7 and then F6 immediately after. By not specifying any text after hitting the F7-Select button, you then "Cut" nothing . . . but clear the Paste buffer. That way, if you again accidentally hit Paste while in BASIC or with the menu, nothing will happen.

Sound Off!

When I first began using the 100, I suffered for about a day with the horrible sounds it made during saving or loading. That was a very strong incentive to figure out the "SOUND OFF" command — just type it in, enter, and presto! No more sound. But it turns out there's another advantage to having the sound off — namely that it gives the CPU more time to concentrate on the job at hand when loading files. So if you're getting I/O Errors when loading a particular file or program, try SOUND OFF.

Practicalities

Want a perfect-sized dust cover when leaving the 100 on your desk at night? That plastic bag that the unit came wrapped in is great — if you saved the packing materials. Otherwise, one of those large plastic freezer bags can suffice. Or how about a printer cable unhooker? Maybe I just have big hands, but I have a devil of a time trying to unplug that printer cable from the back of the 100. I've settled on using a small screwdriver with a 2" long shaft and a blade about a quarter of an inch wide. I stick the screwdriver blade into the middle slot on top, then lean the shaft toward me (nice and easy) using the 100's plastic case for leverage. The plug always comes out smooth and even.

Finally, a word about Nicad batteries. The Model 100 is an excellent device to be powered by Nicads because it draws out power at a relatively even rate and will discharge a set in two to three hours of continuous use. This hard use is actually better for the Nicads than applications where they're discharged only a little and then recharged again. Nicads have a habit of chemically remembering the point to which they were last discharged and can appear to be dying out, even though they may still have 50 percent to go. So, use them hard but get a second batch of Nicads, too. That way the totally discharged set can be recharged as soon as possible, while the freshened set can be popped in. Nicads don't mind working hard, but they need to be charged up right away to prevent that same "chemical memory" effect from setting in on the low side.

Next month: a program using just 640 bytes that counts all the other bytes, and a file size program that lets you instantly determine how big each text or program file is, and tells how much is in Paste and other "buffer zones." PCM

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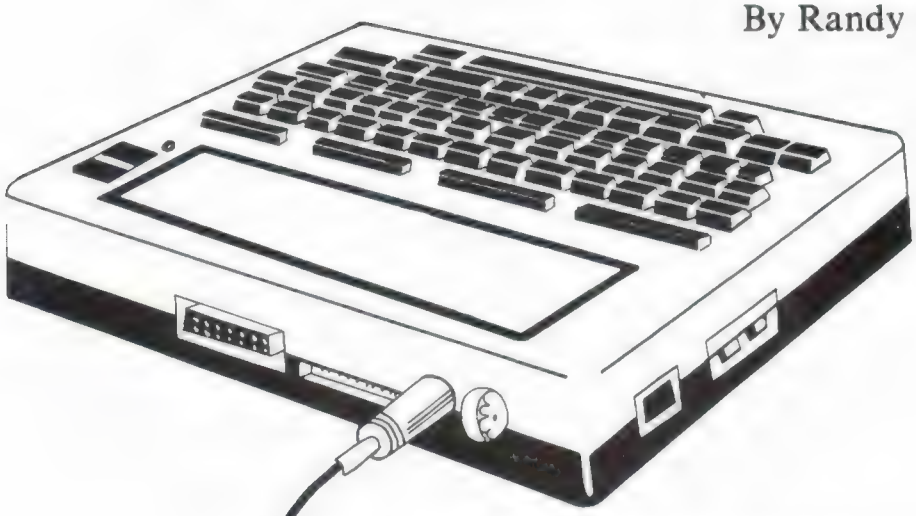
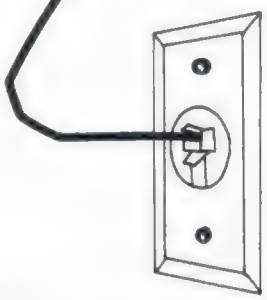
Reaching Out With *TELCOM*

By Randy Graham





Which kind of PoCo owner are you? Are you a telecommunicating sort of person who immediately recognized that PoCo was the best little terminal you had ever seen and just what you needed? Or did you get it for its portability and computing and text-handling talents, noting with interest that it had a *TELCOM* application? Did you think that since this was the wave of the future, it was nice to have the capability when you got around to exploring this hot new field? Well, if you are the latter type, I would like to introduce you to *TELCOM* in a gentle, friendly manner because it is past time that you caught up with the rest of the world. Telecommunicating is not the wave of the future, friend, it is the wave of the present and the tide is rising every day.

Now, Radio Shack has the maddening habit of giving us great looking manuals which tell us everything we need to know. If you ask a question about anything, they always flip open the manual to Page 56 and point out the answer in plain English. Is there anyone out there who has not felt embarrassed about not being able to understand the simple, straightforward explanations in a Radio Shack manual? That's why I thought that if I just re-explained the *TELCOM* application, defining some words as we go, you may catch on this time and save yourself some of the fumbling we have already done. If you are familiar with telecommunicating, you may want to skip or skim the first part of our explanation.

(Randy Graham is a rehabilitation counselor working with the handicapped. Personal computing is his hobby; telecommunications one of his favorite activities. He has done freelance information retrieval and is an inveterate user of the major online systems.)

TELECOMMUNICATION

Telecommunication is a general term for passing data from one computer to another. Let's start by thinking of a terminal connected by cable to the main computer. This is called a "hardwired" setup. Now, let's move the terminal to another location. Instead of stringing wires around town, let's rent a line from the telephone company to connect the terminal(s) to the computer. This is a "dedicated" system. It gets expensive unless the terminal(s) are used constantly or unless security is terribly important. For occasional use, let's devise a system where we can call on a regular telephone line, then put the terminal and the computer "online" for the duration of the exchange. Although we seldom think of it, this is really a "temporarily dedicated" arrangement. For the duration of a telephone call, the two parties have exclusive use of a pathway through the telephone system.

The Modem

Now that we are connected, we need a way for the terminal and the host com-

puter to "talk" to each other. The standard answer is that each has a "modem" at its end of the phone line. This is an electronic device which generates an audible tone which can be transmitted reliably over the standard phone lines and equipment. This tone is "modulated" by the computer's bitstream. At the other end, the bitstream is stripped off the carrier tone ("demodulated") and fed back into the computer. "Modem" is computerese for "modulator/demodulator." It is necessary for the system to know who is host and who is terminal, so that they know which tone to transmit and which one to read. That is why modems have "answer/originate" switches on them. The host computer must also have a "smart modem" which will answer the incoming calls, begin transmitting the "answer" tone and activate the computer.

The Terminal

Notice that we have been referring to the calling unit as the "terminal." At their simplest, terminals send to, and receive information from, a host computer. Data flowing both ways is printed to the screen or to a printer and then it is gone. This is a "dumb" terminal; it lives only for the moment. It does not remember what happened a minute ago, and there is no way to manipulate the data once received.

But if you are using a personal computer as the calling unit and it has a lot of memory and other features, why not feed data into memory for later recall and manipulation like editing? This is a "smart" terminal — one that uses its memory for storage. The memory thus used is called a "buffer" and is limited only by the size of your available memory.

What we have been talking about is called "networking" and your purpose is to multiply your local computing power by gaining access to a network at the heart of which are one or more big computers. Before getting personal with our PoCo, let's review another aspect of networking which has been in the news lately. If the host computer will answer all calls, and set up a communications link, how can we keep just anybody from taking advantage of this open door? Enter "Wargames" and the whiz kids. When you get permission to access a private system, a first consideration is: Who is going to pay for this computer time — called "connect time"? To insure proper billing, you will be assigned an account number. This is public and appears on everything. You will also be assigned a password known only to you and the computer (and anyone who sees your terminal if you tape it to the keyboard as most people do). To get connected to the host, you will have to enter both your account number and your password. The security of the system depends largely on how difficult they make the password system.

To use a personal computer as a terminal to access networks, you need a program to configure your computer as a terminal. You also need to have a modem connected to your computer and to a standard phone line. The program will handle the technical details called "protocols" and will set up the memory buffer. You may have a choice of protocols and may have to enter some choices or "parameters."

"What we have been talking about is called "networking" and your purpose is to multiply your local computing power by gaining access to a network . . ."

POCO AS A TERMINAL

Get out your PoCo. Choose *TELCOM*. Look at the labels. F3 STAT will give you the communication parameters which are set at "default," that is, whenever the power is turned on. These parameters are standard for most network protocols. You probably will not have to change them. F4 TERM exe-

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cutes the terminal program which we said you needed. You are all ready to go online.

With an External Modem

The Model 100 gives you three or four ways to go online. One is to use an external modem. Every modem I have ever seen has a DB25 plug on the back. All you need is a cable to plug into PoCo's DB25 plug. You will have to reset your communications parameters and you will give up a lot of beautiful built-in features. Why would anyone do this? The only two reasons I can think of is that you already own a modem and do not want to buy Radio Shack's cables, or that you want to communicate at 1200 Baud.

Let's talk about Baud rates. This is the speed at which data is transferred and is controlled by the modem. Back in the good old days when Grandaddy sent information around the country on teletypes, the standard Baud rate was 110. This means that 110 bits per second went out over the network. Since one character takes 7 or 8 bits plus one or two "stop bits" (don't worry about what that means), it takes 10 bits generally to transfer one character. And so, 110 Baud is 11 characters per second. If a page contains 60 lines of 65 characters each, that is about 3600 characters, it will take over 300 seconds or about five minutes to transmit that page by teletype. That is plenty of time to drink a cup of coffee and eat a cheese sandwich. Out of respect for our elders, most systems will still run on 110 Baud, but it is awfully tedious.

With the dawn of the electronic age, they decided to up the rate to a real whizzer: 300 Baud. This is still the standard used by most systems and approved by the telephone people for reliable transmission. All inexpensive modems run at 300 Baud, including the one built into the PoCo. At 30 characters per second, it will take us 120 seconds or two minutes to transmit that page of typescript. This can still get tedious, but you will have to get used to it.

You can get modems for personal computers that can transmit at 1200 Baud. This saves you time and connect time. At 120 characters per second, we would get rid of that 3600 character page in 30 seconds. Why doesn't every one use these state-of-the-art devices? Why didn't Radio Shack build one into the PoCo? Because they start at around $500, and it takes a lot of connect time on expensive computers to justify their cost.

Your PoCo can actually transmit and receive faster than 1200 Baud if properly set and connected to the right modem. You will hear stories of the big professional computers running at 9600 Baud, but they use dedicated lines with coax cables, etc. You may meet the fellow who insists that he has transmitted at 4800 Baud over regular telephone lines. He may be the fellow who can also prove that he drove from New York to San Francisco in eight hours. My rule for living is, never argue with a man who has been drinking. Believe me, you will spend your life communicating at 300 Baud unless you are lucky enough or rich enough to have a 1200 Baud modem.

"The third and preferred way to use the Model 100 for communicating is with the little clothes-pin-like clips on them."

With an Acoustic Coupler

We were talking about the ways PoCo will communicate. The second way is to use the special acoustic coupler Radio Shack sells. Acoustic coupling means that you are going to hookup a speaker from your modem to the mouthpiece/microphone of the standard telephone and a microphone to the earpiece/speaker. Most of these acoustic couplers are a single unit, sized so that you just place the telephone handset into little rubber cups. For the Model 100, Radio Shack chose to make two separate pieces — I guess to improve portability.

To use this approach, you buy the acoustic coupler and plug it into the PHONE plug on PoCo. Set the switch on the left side to ACP and the other to ORIG and you are ready to go. Access *TELCOM* and TERM. Place the speaker and microphone units on the handset and dial the number. PoCo's speaker will buzz when the host answers. It will also give you a "busy" signal.

When using the acoustic coupler you are surrendering a few nice built-in features like autodialing from the textfile address list. Why should anyone take this approach? Because the phones you are using are hardwired and not accessible for direct connection. In motels, the phones cannot be disconnected because people will steal them. And at the office, where you have multiple lines with buttons and lights, the cable is too big and expensive to cut into. In such circumstances you must use the acoustic coupler.

With Direct Connection

The third and preferred way to use the Model 100 for communicating is with direct connection. You can do this if your phone has the little wires with the little clothespin-like clips on them. In this case you buy the strangest looking cable you have ever seen from your Radio Shack store and plug it right in. Let's try it.

You have two big DIN plugs which may or may not be hooked together. If they are, unhook them. One will slide on a loop along the two wires coming out of the other plug. I will call one of the wires blue and the other tan. Take your phone with the modular plug. Unplug the line from the phone and plug the blue wire into the phone. Don't worry about shocks or shorts; we are talking 12 volts here. The tan wire has a little box on the end. Plug the line you took out of the phone into the little box. It will only go one way. Now pick up your phone. Dead as a doornail, huh? No, no, it is supposed to be dead. If it's not, you did something wrong. Now slide that plug up the wires and plug the two DIN plugs together. They will only go one way. Peek at the pins. Now pick up your phone. Works, normally, huh? Please, let it work normally; it is supposed to.

This is the way you leave the cable if you want to leave it connected to the phone while PoCo is elsewhere. You are ready to hook up at any time, but the phone works normally. If you want to take the cable with you, reverse the process: disconnect wire from box, take blue wire out of phone, plug line into phone.

Back to the cable hooked up in line with the phone. Disconnect the DIN plugs and plug the one with pins into PoCo's PHONE plug; set one switch on the left side to DIR and the other to ORIG. Try the phone; works fine, right? Turn on PoCo, select *TELCOM*. You are ready to go — but first let's take another little excursion just for the sake of completeness.

You have another option for direct connection with the modular plugs. Suppose you do not have an extension

phone handy but do have a modular jack. You can use the direct connect cable. Ignore the blue wire. Take the little box off the tan wire and plug this wire into the jack. Ready to go, except that you will have to use the autodial feature to place your calls. See below. Incidentally, if you do not have the modular system, it is pretty easy to install almost anywhere. Talk to people wherever phones are sold these days. They will have the stuff and the advice. Like I said, we are talking low voltage; there is no danger.

PLACING THE CALL

You Dial

Back to the setup with PoCo connected in line with a modular phone and *TELCOM* selected. There are three ways to place calls. You can dial the number. When you hear the computer answer with a steady tone, press F4 TERM. The phone will go dead, and so you might as well hang it up. PoCo has taken over and will keep control of the line until you press F8 BYE and answer Y when it asks DISCONNECT?

PoCo Dials

The second way to place a call is to press F2 CALL. PoCo will print CALL and you type in the number, which can include the area code. You may include hyphens or omit them; PoCo will ignore them. It will not ignore or accept anything except numbers and hyphens. You can write 1-800-555-1212 or 1800 5551212. When you ENTER, PoCo will print CALLING and start typing out the digits. You will hear the pulses over its speaker. Yes, it does pulses, not Touch-Tones; you do not need a Touch-Tone-enabled line. For some strange reason, the manual says to pick up the phone before the dialing is completed. When the host computer answers, press F4 TERM and proceed as above.

A third way to make a call is to plan ahead. Set up your ADRS.DO file for the *ADDRESS* program and enter the phone number. If you do not want the whole address, use any code designation, like CIS for CompuServe. Use a colon, enter the whole number and close with a coion. Now, back to *TELCOM*. To call CompuServe, press F1 FIND. PoCo will print FIND and you type CIS. PoCo will start dialing the number. This time you do not have to pick up the phone. Get a busy signal? Just F1 CIS F2 to try again. When you get through to the computer, press F4 TERM and proceed as above. As noted previously, this is the only option you can use if you are plugged directly into a jack. This option also allows you to set up your whole logon sequence for automatic access.

The Terminal Program

Okay, let's do a little reviewing. So far, we have hooked up PoCo to the telephone system, using either an external modem connected to PoCo through its RS-232 port, the built-in modem using an acoustic coupler, or the built-in modem using direct connection with the modular cable. We have looked at the features of the TELCOM program which help us place calls and execute the terminal program. Before we actually logon to a network, let's examine a few more features of PoCo's terminal program.

Full Duplex

We have to remember that when we logon to a host computer, it takes charge of the interchange of data. Me master, you slave. For example, when you type "A," it appears on the screen. But you did not do it; the host computer did. You sent an "A" over the network. The host computer read it and sent back to your screen. Then you send "B" and the process repeats. This process of echoing back what you send is called "Full Duplex" and is PoCo's default setting. If you press F4, "FULL" on the label line will change to "HALF." In half-duplex mode, what you type goes on your screen because the other computer is not echoing. If you press F4 again, the label changes back to "FULL." This setup where pressing one key switches back and forth between two values is called "toggling." Almost all host systems use full duplex. If you are running in full duplex and nothing is showing up on your screen, or you are getting garbage, either you have noise on the line or your parameters don't match. This is a "give up" situation. Hang up and dial again. If that still does not work, call the system operators and talk to them about it.

Downloading

Another feature of being a "slave" terminal is that data scrolls up and off the screen and is gone. Gone as in "gone." The only way to look at it again is to ask the host to retransmit it. PoCo saves the last page received and you can review it by pressing F1 PREV. This is a strictly local activity invisible to the host which is still going about its business or waiting for your next input.

But we said we wanted our precious PoCo to be a "smart" terminal and save data in memory for later manipulation. Why doesn't the terminal program do this? Because you have relatively little free memory available and you will quickly fill it up. When the memory buffer was full, it would stop saving and subsequent data would be lost. PoCo compromises with you with its Download function. You do not want to save all the logon procedures, system messages and setting up activities. When you get to a file you want to save, press F2 DOWN. PoCo will ask, "FILE TO SAVE." This is not the incoming file's name. What PoCo wants you to do is to create a text file in RAM. When you do — this is also an acitivity invisible to the host — "DOWN" will appear on the label line in inverse video. Now, everything being received is going into your text file. Press F2 again to stop saving and again to resume saving — the old toggle. Whenever "DOWN" is in inverse video, everything is being saved; when it is normal, nothing is being saved. You can also save hardcopy of the whole business or part of it if you have your printer connected by toggling F5 ECHO. If you are running 300 Baud, the printer will be able to keep up with you.

Uploading

The other side of downloading (host computer to you) is uploading (you to host). If you want to send a message to a bulletin board or a memo to the home office, you can do it ahead of time in a text file. Do all of your editing and correcting on your own time. When you are ready to upload online, press F3 UP. PoCo will ask for the filename. Give it in proper form and ENTER. PoCo will transmit it at a steady 300 Baud.

Just to complete our review of the function keys, if the host computer puts you on hold (because many people are using it simultaneously), "WAIT" will appear over F6. Do what it says; it will get back to you in a moment. Meanwhile the protocol called XOFF is holding your connection at the point of last activity.

We were talking earlier about losing data because it scrolls off the screen and asking the host to retransmit. All systems have control codes which you can send to pause, stop, abort, repeat, etc. You have to learn them for each system and have a little reference manual handy. Most of them are getting to be standard and as you become experienced, you will quickly pick up the ones used on the

systems you use. All systems also have "Help" functions if you get stuck. They don't really help; they just print out the accepted procedures.

Let's Get Online

Well, we have PoCo all set up and ready to go. Now, who are we going to call? I can think of half a dozen general categories, but there are several which will be excluded. We will not attempt to break into the computers at NORAD, the Pentagon or the IRS. Another category we'll overlook is communications between small computers. Actually, this is not hard. You and your buddy want to swap software. He can get in his car and bring you a tape or disk, or he can mail it to you. Or he can call you and upload it. This is a time when you use your half duplex mode.

What does that leave us? Let's try bulletin boards, big information services and smaller information services. Let's start with bulletin boards.

Computerwise, a bulletin board is a computer with a smart modem, a lot of storage and a program that lets people leave messages. Like the bulletin board in the cafeteria down at the plant, a computer bulletin board is a mixture of notices and personal notes people put there. You can learn a lot by reading all that stuff — or at least kill a lot of time. To put a note up on a computer bulletin board, or to read other people's notes, just give the board a call with your PoCo.

Bulletin boards are run by computer stores, clubs and individuals who just like to promote communications. It is much the same spirit as the ham radio operator. They are free to anyone who calls; your only expense is the telephone call. Evenings and weekends it is practically nothing. You just have to know the board's number. And with your PoCo, you can access any of them. You will find they have different names: ABBS means an Apple board, Forum80 is Radio Shack, etc. But this refers to the system on which it is running. Your terminal program and modem speak a universal network language.

You will find that bulletin boards talk about "supporting" certain computers or being "dedicated" to certain systems. This means that although you can read their messages, you will be bored because everybody is talking about Apples or Commodores or CP/M. If you can find one dedicated to portable computers, you will know that you are among friends. There are some around. Stay tuned.

You logon to a bulletin board by calling its number, just like we said. You will hear the tone, switch to TERM and ENTER. You may start getting a welcome message. If not, ENTER and if that does not do it, ENTER again. If you still do not get an answer on your screen, try BREAK or CONTROL-C.

Typically, after you ENTER once, the bulletin board starts giving you a welcome and identification message. Then it will ask your name and hometown. Use the same form of name all the time; in the future it will recognize you and tell you if you have a message waiting.

After the welcome and get acquainted bit, you will be given a menu. One option is to read information about the system. This just tells you about the computer and software and other stuff. You do not need to read this. You will also be given a chance to read instructions on how to use the board. This is where you get all your control codes. Do read this section and save it. I print this out for future reference when I call the board again.

The menu will also offer you the chance to read messages or leave messages. Messages are numbered and filed in the order received. At first, just read over them to get the idea. People are talking to other people, asking questions about their equipment, talking about computer stuff they have seen or bought or read or done. At first these are all strangers and the stuff may not interest you. If you keep accessing bulletin boards, it will dawn on you that you have joined a nationwide computer club. Here are people who share your interest. You get to know the personalities of the regular callers; you learn to know who knows what he is talking about. You leave a question and get an answer. One day someone asks a question for which you know the answer and the next time on, he has left a thank-you note. It is sort of like the old days of the railroad telegraphers who talked to each other online without ever meeting face-to-face. This is a pleasant and fruitful sideline to computing and I think everyone ought to spend some time keeping in touch on a couple of favorite bulletin boards.

Many bulletin boards also have a library of programs which you can download free. This is a valuable source of homemade software, and a nice place to make yours available.

Before signing off, you are usually given the option to leave a message for the "sysop," the system operator. He is almost never actually there to help, but he will leave a response for you. Problems? If you cannot logon successfully, or get garbage, you are not matched up properly. Just hang up until you can get the right scoop. If you have trouble while online, CONTROL-C will almost always get you back to the main menu. If all else fails, just hang up the phone; the bulletin board program knows how to reset itself.

> "Like the bulletin board in the cafeteria down at the plant, a computer bulletin board is a mixture of notices and personal notes people put there."

To recap quickly, bulletin boards are public programs easily accessed by telephone with your PoCo. Where to start? Well, most boards have lists of other boards. One good place to start is "The Rainbow Connection" operated by Spectrum Projects. Just look in their ads — the numbers are always at the bottom of the ad. This board supports the M100, has a list of other boards and a lot of neat programs you can download. Of the multitude of boards on the West Coast, Novation's board (the modem people) has a very complete list of boards around the country: 213-363-9666. The Imagination Factory in Anaheim, Calif., has "IF Magazine" on line as well as a good list: 714-772-8968. On the East Coast, Amerand (Amateur Radio) in Fairfax Va., has a list that can be searched by areas of the country: 703-978-7561. Those should be enough to get you started.

Information Services

That's the bulletin board bit, so to

speak — so what's next? Let's try information services. The three you have probably heard about are CompuServe, the Source and Dow Jones. Each of them is available to the casual or business user for a small fee. Getting to them will introduce you to another dimension of this fascinating world: the communication networks.

When you subscribe to one of these commercial services, you will get instructions for accessing it. If you are lucky, the service has a local number you can call; all you will pay is for connect time. If there is a local number outside your dialing area, you will have to call long distance and pay this charge to the telephone company as well as connect time to the information service. Another option is to utilize the networks: Telenet, Tymnet or Uninet. If you have a number for these in your town, you call it and request the service you want per instructions. There is a $2 per hour surcharge for this network which is billed to the information service which adds it to your bill. The worst luck is to have to call the network long distance so that you are paying toll charges, surcharge and connect time.

Your local Radio Shack store can sell you a CompuServe starter kit for $20. If you buy the direct connect kit described above, this starter kit is included. In this kit will be an application, an account number and temporary password and basic instructions. Following instructions, you logon to CompuServe with the temporary password and are immediately shunted to a program which gets basic information including your credit card number. Credit card billing is the only way they want to do business. You follow up by mailing them the written application. Also included in the starter kit is a free hour on CompuServe.

CompuServe is a collection of databases, all menu-driven, meaning that you move from one list of choices to another until you get where you want to be. Services available range from a whole bunch of games you can play online to reference works and airline schedules to a library of programs in public access. You have a private personal computing area and file space. More can be rented for a small charge. This is a good place to store your bulky PoCo files to clear your RAM.

One feature you will want to check out is the SIGS (Special Interest Groups). There are many topical ones and one dedicated to the M100. Get acquainted with all your PoCo neighbors around the nation and download a bunch of free programs. Time on CompuServe evenings and weekends costs $6 per hour figured to the nearest minute, plus surcharge as noted above.

The Source is similar but more expensive. Subscribing (through a local computer store) costs $100 and there is a minimum monthly charge of $10. Services available are similar.

Another familiar name is Dow Jones, as in Dow Jones. As you might guess, their service is heavily business oriented but they also include some "popular" services. Application, logon instructions and a free hour are included in the starter kit you get from Radio Shack. They bill directly instead of by credit card.

If you are interested in these services but have no experience with them, one way to explore is to ask for a demonstration in the store where subscriptions to these services are sold.

Beyond CompuServe and The Source are the big leagues. One of the biggies is the New York Times Information Service, which has the whole text of the papers for umpteen years available for online searching. You can search by topic, author or date — at $150 per hour. Training by NYTIS is required before you can open an account.

The two big general services are Dialog and BRS (Bibliographic Resources Service). Both of these are highly sophisticated libraries of literally hundreds of databases listing mostly journal and occasional publications. No professional literature search is complete without them now; they are the world's biggest card catalogs. Both require training seminars to open accounts and their connect charges run from $15 to $300 per hour. These are the people who can save money using 1200 Baud transmissions!

These big fellows are used mostly by librarians and a local library, especially a university one may give you a demonstration. I mention them here for completeness and just note in passing that there is the possibility of a little moonlighting as a freelance information specialist if you learn to use them. Both services also offer popular versions. Dialog calls theirs "Knowledge Index" and BRS's is "BRS After Dark." Hours are limited and only a few databases are available. Costs are more modest so that if you are interested in edging into this exploding field, you can start there.

A New Wrinkle

The mail just brought me an introduction to the latest wrinkle in telecommunications. MCI, the long distance people, are offering MCI Mail. You can upload mail to their system and it will be sent electronically to the nearest of their centers where it will be printed and dropped in the mail or delivered by messenger. There is a lot to explore in this system, but at first blush, it seems like a user-controlled version of the old Western Union telegram.

Okay, now do you believe that telecommunications is the "wave of the present" and that there is plenty you can do with your PoCo? So, what are you doing sitting around reading magazines — get online! PCM

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Automatic Line Numbering For BASIC

By Larry Randall

One of the few things lacking in the Model 100 software is automatic line numbering. When there are several thousand bytes of BASIC to copy into my "100," I don't want to have to copy all the line numbers, too. To solve this situation, I wrote *AUTO* — a BASIC program that will automatically number the lines as you enter your program.

When running *AUTO* you will first be asked to Enter File Name, which will be the name of the BASIC program you will be entering into *AUTO*. (This automatically numbered BASIC program will be saved originally as a text file.) You will then be asked for Start Line #. This is the line number with which you want your program to start, or continue. Next you will be asked for Line Increment, which is the numeric increase in each line number. At this time *AUTO* will appear in the upper left corner of the display and you are in the ENTRY mode.

During ENTRY mode, lines could look like this: > 100. At this point *AUTO* will wait for you to enter your program line. When you press ENTER at the end of your program line, a new number will appear. This sequence will continue until you terminate it by typing one of the control functions described further in Table 1.

There are several functions allowed by *AUTO*. Each function must be entered as the first statement on any program line and followed immediately by the ENTER key. These functions will not be sent to the text file, but will be executed at once.

If you wish to reenter a line while still in the ENTRY mode, simply type ARST. Then answer "Start Line #" with the number of the line to be reentered. In answer to "Increment," enter a zero. An increment of zero indicates to *AUTO* that only one line will be entered, and then a new Start Line # is to be selected. Entering a line with the same number as a previous line will cause that line number to appear again in the text file you are generating. Not to worry. When translating the

text file into BASIC, only the last entry of any line number will appear in the BASIC program.

Editing of the program lines themselves can be done by accessing your file in text mode, or after the file has been loaded into BASIC, the edit feature may be used.

When starting or restarting *AUTO*, you may press ENTER for Start Line # and Line Increment. If this is done, both will remain as they were previously.

When you have finished entering your program, type AMENU. Then enter BASIC and load your program. Also, you may type ARUN while in ENTRY mode and your program will load into BASIC and RUN. (Don't forget to save the new BASIC version to RAM.)

AUTO was designed to save time and effort in writing, or copying, a program into the Model 100. The longer the program, the more you save. It might even be called a *program processor*.

Table 1

Function	Description
1) ALIST	*List, to display, the entire program file you have entered.
2) ALIST:	*List, to display, a range of program lines. You will be asked for start and stop line numbers.
3) APRINT	*List, to printer, the entire program you've been typing.
4) A?	*Same as APRINT.
5) ARUN	Causes your program to be loaded into BASIC and executed. (Remember to SAVE"RAM:xxxx", where "xxxx" is the program name.)
6) AEND	End ENTRY mode and enter BASIC.
7) ARST	Restart ENTRY mode with new line number and increment.
8) AMENU	End ENTRY mode and go directly to main Model 100 menu.
9) AKILL	Kill the file you are presently entering program lines into. You will be asked to verify prior to execution. After AKILL, *AUTO* will restart at Enter File Name.

*After the last line is listed or printed, *AUTO* will wait for you to press ENTER. Pressing ENTER at this point will return you to the ENTRY mode at the same place you were when you typed in the last function.

(Larry Randall, who has been using computers since 1975, is a retired Navy technician and writes software both for fun and for his job with Burroughs Corp.)

The listing:

```
0 REM   AUTO.BA v2.2
10 REM  by:     LARRY RANDALL
20 REM          12306 TERI DR.
30 REM          POWAY, CA. 92064
40 REM VARIABLES FOR AUTO
50 REM BL CU EL IC L LN$ OP$ Q$ SL VA
60 CLS:CLEAR500:DEFINTA-Z:MAXFILES=2
70 INPUT"ENTER FILE NAME ";FN$:IFLEN(FN$
)<1ORLEN(FN$)>6THENPRNT"INCORRECT":BEEP:
GOTO70
80 REM-- RESTART HERE --
90 INPUT"START LINE # ";SL$:IFSL$<>CHR$(
13)THENSL=VAL(SL$)
100 INPUT"LINE INCREMENT ";IC$:IFIC$<>CH
R$(13)THENIC=VAL(IC$):CLOSE
110 REM--PREPARE FOR ENTRY --
120 OPENFN$+".DO"FORAPPENDAS1:CLS:CU=40
130 PRINT@0,CHR$(27)+"K";"<AUTO>"
140 PRINT@CU,">";SL;:LINEINPUTLN$
150 REM--CHECK FOR FUNCTIONS--
160 IFLN$=""THEN130
170 IFLN$="ALIST"ORLN$="APRINT"ORLN$="A?
"THEN290
180 IFLN$="ARUN"THENCLOSE:RUNFN$
190 IFLN$="ALIST:"THEN370
200 IFLN$="AEND"THENCLOSE:END
210 IFLN$="ARST"THEN90
220 IFLN$="AMENU"THENCLOSE:MENU
230 IFLN$="AKILL"THEN430
240 REM-- PREPARE LINE FOR FILE --
250 LN$=STR$(SL)+" "+LN$
260 IFLEFT$(LN$,1)=" "THENLN$=RIGHT$(LN$
,LEN(LN$)-1):GOTO260
270 PRINT#1,LN$:IFIC=0THEN90ELSESL=SL+IC
:CU=CSRLIN*40:GOTO130
280 REM-- LIST/PRINT ALL --
290 CLOSE:OPENFN$+".DO"FORINPUTAS1
300 IFLN$="APRINT"ORLN$="A?"THENOP$="LPT
:"ELSEOP$="LCD:"
310 OPENOP$FOROUTPUTAS2
320 IFEOF(1)THENPRINT:PRINT"<ENTER> TO C
ONTINUE";:GOTO340ELSELINEINPUT#1,IN$:PRI
NT#2,IN$
330 IFINKEY$<>CHR$(13)THEN320ELSE350
340 IFINKEY$<>CHR$(13)THEN340
350 CLOSE:GOTO120
360 REM-- LIST A RANGE --
370 CLOSE:OPENFN$+".DO"FORINPUTAS1
380 CLS:PRINT"LIST RANGE":INPUT"START: "
;BL:BL=INT(BL):INPUT"END: ";EL:EL=INT(EL
)
390 IFEOF(1)THEN410ELSELINEINPUT#1,A$:L=
INSTR(A$," "):VA=VAL(LEFT$(A$,L))
400 IFVA=>BLANDVA<=ELTHENPRINTA$:GOTO390
ELSE390
410 IFINKEY$<>CHR$(13)THEN410ELSECLOSE:G
OTO120
420 REM-- KILL PRESENT FILE --
430 CLS:BEEP:PRINT"ARE YOU SURE YOU WISH
 TO KILL '";FN$;"'":PRINT"(Y/N) ?";:BEEP
440 Q$=INKEY$:IFQ$=""THEN440ELSEPRINTQ$:
IFQ$="Y"THENKILLFN$+".DO":GOTO70
450 CLS:GOTO130
```

PCM

Is your day too full for you to remember all those engagements you set up last week? Maybe you need to try this . . .

Short-Term Memory Booster!

By Nathaniel F. Ireland

*Note: In order to use **REMEM**, TIME$ must be correctly set according to the manual. When on a trip, be careful to reset TIME$ when crossing time zones. Suggestion: To conserve the internal batteries, use an external power source such as the Radio Shack AC adapter if you plan to use **REMEM** over a long period of time.*

Do you ever forget appointments? Do you ever find a show you wish to see in the TV guide, then miss it because you lost track of the time? How about missing an early morning appointment because the hotel operator forgot your wakeup call? Well, embarrassments like these were the spawn for the *REMEMber* program.

The *REMEM* program (Listing 2) displays the correct time at the top of the screen and is designed to remind you of appointments on a short term basis, usually one day. These appointments are set up in a RAM file under the name APPMT.DO usually in the late afternoon of the previous day or early morning of the day. Appointments can be added to the file during the day as required to a maximum of 16.

A beeping sound and "* APPOINTMENT *" flashing on the screen announce the time of an appointment has arrived and the nature of the appointment and its time are indicated. If, after one minute, the alarm has not been reset by pressing the ENTER key, the screen will clear, leaving the time display and a "PRESS A TO REVIEW MISSED APPOINTMENT" message will appear. When the A key is pressed, all the appointments within the last hour will be presented. If the ENTER key is pressed within one minute, RESET will display in place of the flashing APPOINTMENT and in about 10 seconds the screen will clear except for the time display.

When the last appointment has been displayed and reset, an appointment complete message will be displayed and a beeping will last for about 10 seconds, then the program will end. If any appointments have not been reset by pressing ENTER, an appointments missed message will display and a direction to press the A key will be displayed. If the A key is not pressed in 30 seconds, the program will turn off the LCD display. When the power is turned on again manually, you are given a choice of reviewing the appointments within the last hour or terminating the program.

Obviously, while *REMEM* is operating, the Model 100 cannot be put to other uses. However, *REMEM* is so constructed as to permit other programs to be run, or even the power turned off, without loss of data when power is turned back on and *REMEM* is rerun. Naturally, an appointment occuring when *REMEM* is not running will be listed as "LATE," if it is within one hour of the current time. In line 10 of the program listing 2, the value of AR is set to one. This provides for a one minute limit to the alarm before the automatic reset. If a longer alarm period is desired, an increase in the value of AR will increase the alarm period by a like number of minutes.

In line 10 of program listing 2, the value of AR is set to one. This provides for a one minute limit to the alarm before the automatic reset. If a longer alarm period is desired, an increase in the value of AR will increase the alarm period by a like number of minutes. To leave the program, press SHIFT BREAK; to return, simply RUN the program.

Creating the *APPMT.DO* File

To create the text application file for storing the appointment times and messages, run the program *APPMT.BA* (Listing 1). The entries are menu-driven and the first entry is the appointment date entered as mmddyy, i.e., 031584 or the ENTER key will place the default date of the DATE$ in the computer's memory. Then press ENTER if you have typed in the date. Next, the screen will ask for the time in 24-hour form, i.e., 1533 ENTER. Finally, an appointment prompt will ask for the message which can be up to 34 characters. Press ENTER when the message is entered. To stop the entry process, type "END", ENTER, and press F8 to return to the main menu. The appointment information is stored as *APPMT.DO* and can be edited using the text file mode. Only 16 appointments can be stored as the program is presently structured.

(Nathaniel Ireland, now a retired gentleman farmer, was an engineer in the electronics industry for many years. In addition to his agricultural hobby, he finds time to enjoy his computers and do some consulting work.)

Listing 1:

```
10 REM **   APPLDR PROGRAM   **
20 REM  *  For creating and  *
30 REM  * adding to APPMT.DO *
40 REM  *        FILE        *
50 CLEAR720:DIMCC$(16),A$,B$,C$:DEFINTD,
A,N,T,Y:CLS
60 PRINT"     APPOINTMENT FILE LOADER PR
OGRAM":PRINT:PRINT"To add to file, press
 <ENTER>.":PRINT"To create a new file, p
ress <1>, then   press  <ENTER>.":INPUTE
:IFE<>1THEN270
70 CLS
80 PRINT@29,"ENTRIES=";Y
90 READA:IFA=100THEN190ELSEREADA$:I=I+1
```

```
100 DATA 40,"Date(<ENTER>=today):",80,"T
ime:",120,"Appointment:",100
110 PRINT@A,A$;
120 INPUTB$:IFN=0ANDB$=""THENB$=LEFT$(DA
TE$,2)+MID$(DATE$,4,2)+MID$(DATE$,7,2):P
RINT@62,B$
130 IFN=0ANDB$="END"ORN=0ANDB$="end"THEN
D=D-1:GOTO220
140 IFN=0ANDLEN(B$)=6THENN=1:GOTO160:ELS
EIFN=0ANDLEN(B$)<>6THENB$="":I=0:RESTORE
:CLS:GOTO80
150 IFN=1ANDLEN(B$)=4THENN=2:ELSEIFN=1AN
DLEN(B$)<>4THENB$="":C$="":I=0:N=0:RESTO
RE:CLS:GOTO80
160 C$=C$+B$:B$=""
170 IFI<3THENC$=C$+CHR$(32)
180 GOTO90
190 CC$(D)=C$:D=D+1:C$="":N=0:I=0:Y=Y+1:
RESTORE:CLS
200 IFY=16THENPRINT@120,"FILE FULL":GOTO
210:ELSE80
210 FORZ=0TO800:NEXT
220 CLS:PRINT"       RECORDING DATA FILE"
:OPEN"RAM:APPMT.DO"FOROUTPUTAS1
230 FORT=0TOD
240 PRINT#1,CC$(T)
250 NEXTT
260 CLOSE:CLS:END
270 CLS:PRINT"      READING DATA FILE"
280 OPEN"RAM:APPMT.DO"FORINPUTAS1
290 IFEOF(1)GOTO320
300 INPUT#1,B$
310 CC$(D)=B$:B$="":D=D+1:GOTO290
320 CLOSE:CLS:Y=D
330 IFY=16THENPRINT"FILE FULL":END:ELSE8
0
```

Listing 2:

```
5  REM "REMEM" PROGRAM
6  REM GIVES APPOINTMENTS AND TIME
10 CLEAR720:DIMT1$(16),M1$(16):DEFINTM:A
R=1:NN=-1:CLS
90 ONERRORGOTO610
100 OPEN"APPMT.DO"FORINPUTAS1
110 IFEOF(1)THEN190
120 INPUT#1,A$
150 D$=LEFT$(A$,2)+"/"+MID$(A$,3,2)+"/"+
MID$(A$,5,2)
160 IFD$=DATE$THENT$=MID$(A$,8,2)+":"+MI
D$(A$,10,2)+":0":M$=RIGHT$(A$,LEN(A$)-11
):GOTO180
170 A$="":GOTO110
180 T1$(N)=T$:T$="":M1$(N)=M$:M$="":N=N+
1:IFN>15THEN190:ELSE110
190 CLOSE:N=N-1
200 FORM=0TON:PRINT@56,TIME$
205 T7=(VAL(LEFT$(TIME$,2))*100)+VAL(MID
$(TIME$,4,2))
210 T1=VAL(LEFT$(TIME$,2))-1:T2=VAL(MID$
(TIME$,4,2)):IFT1=0THENT1=24
220 T3=(T1*100)+T2
230 T2$=T1$(M):T4=VAL(LEFT$(T2$,2)):T5=V
AL(MID$(T2$,4,2)):T6=(T4*100)+T5
235 IFT6<T7ANDW=0THENNN=NN+1:FL=1:GOTO29
0
240 IFT6>T3ANDT6<T7THEN245:ELSE290
245 PRINT@200,LEFT$(T1$(M),5)+" ";M1$(M)
:PRINT@293,"PRESS <ENTER>";
250 FORC=0TO10:PRINT@56,TIME$:NEXTC:BEEP
260 PRINT@138,"LATE?"
270 S$=INKEY$:IFS$=CHR$(13)THENCLS:GOTO2
90
280 FORD=0TO10:PRINT@56,TIME$:NEXTD:BEEP
:PRINT@138,"      ":GOTO250
290 NEXTM:W=1:IFST=1THENEND:ELSEIFN=NNTH
EN500
300 FORM=0TON:PRINT@56,TIME$
310 T$=LEFT$(TIME$,7)
320 IFT1$(M)=T$THENNN=NN+1:GOTO400
330 S$=INKEY$:IFS$="A"ORS$="a"THENFL=0:C
LS:GOTO200
335 IFFL=1THENPRINT@280,"PRESS 'A' TO RE
VIEW MISSED APPOINTMENT";
340 NEXTM:GOTO300
400 PRINT@200,LEFT$(T1$(M),5)+" ";M1$(M)
:PRINT@289,"PRESS <ENTER> TO RESET";
410 FORC=0TO10:PRINT@56,TIME$:NEXT:BEEP
420 PRINT@132,"* APPOINTMENT *"
430 S$=INKEY$:IFS$=CHR$(13)THENPRINT@132
,"     RESET      ":GOSUB600:CLS:GOTO500
440 T3$=T1$(M):T8=(VAL(LEFT$(T3$,2))*100
)+VAL(MID$(T3$,4,2))+AR
450 T9=(VAL(LEFT$(TIME$,2))*100)+VAL(MID
$(TIME$,4,2))
460 IFT9=T8THENFL=1:CLS:GOTO500
470 FORC=0TO10:PRINT@56,TIME$:NEXT:PRINT
@132,"                ":BEEP:GOTO410
500 IFN=NNTHENPRINT@130,"APPOINTMENTS CO
MPLETE":ELSE300
510 FORC=0TO25:NEXT:BEEP:CC=CC+1:IFCC=50
THEN520:ELSE510
520 IFFL=1THEN530:ELSEEND
530 PRINT@210,"APPOINTMENT MISSED":PRINT
@290,"PRESS 'A' TO REVIEW";
540 GOSUB620:CLS:POWER OFF,RESUME
550 PRINT@56,TIME$:PRINT@120,"TO VIEW AP
POINTMENTS WITHIN ONE HOUR OF THE ABOVE
TIME, PRESS 1. PRESS 2 TO END"
560 S$=INKEY$:IFS$="1"THENCLS:FL=0:ST=1:
GOTO200
570 IFS$="2"THENEND
580 GOTO550
600 FORD=0TO400:PRINT@56,TIME$:NEXTD:RET
URN
610 IFERR=52THENCLS:PRINT@124,"APPMT.DO
FILE NOT IN MEMORY.":END:ELSE RESUME
620 FORD=0TO400
630 S$=INKEY$:IFS$="A"ORS$="a"THENST=1:F
L=0:CLS:GOTO200
640 NEXTD:RETURN
```

PCM

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HARDWARE

Bar Code Reader For Model 100

Radio Shack recently introduced its hand-held scanner for reading bar codes. The package (26-1183) consists of the bar code reader or wand, a cassette with the software for operating the wand and sample programs, and a 50-page instruction manual. The operation of the wand is easy once you practice with it. More on that point later.

The manual is very well written in Radio Shack style (which is a good model that some of the other software writers should follow). In case you are not completely familar with the three types of bar codes, the manual covers what bar codes are, the three codes available for use by this software, i.e., Universal Product Code (UPC-A), Code 3 of 9, and Plessey Code. The UPC-A code is the one found on most commercial products, especially food products, *PCM* magazine, and other high volume products. The standard UPC code read by the RS bar code reader is identified by the left, center, and right guard bands being longer than the others. The string consists of 11 numeric characters, the first being printed to the left of the bar code symbol and the other 10 being printed beneath the bar code. If you have been in a modern, computerized grocery recently, you may have noticed the scanning equipment for reading UPC in the checkout counter. The UPC provides a high degree of reliability.

The second code readable by the wand is Code 3 of 9, an uppercase, alphanumeric code widely used in industry and the Department of Defense. The code is structured similar to ASCII code using 43 characters: 10 digits, 26 alphabetic letters, and six symbols. The pattern on Page 43 of the manual closely resembles a binary long-short code. This code can also be printed on a dot matrix printer. The nicest feature of this code is its alphabetic letters, which means that computer programs could be printed on a DMP and published that way. No more tapes? I doubt it, but it does open many new doors. Bar codes can't be wiped out by magnetic fields, but can be erased by too many passes over the printed code.

The third code available is called

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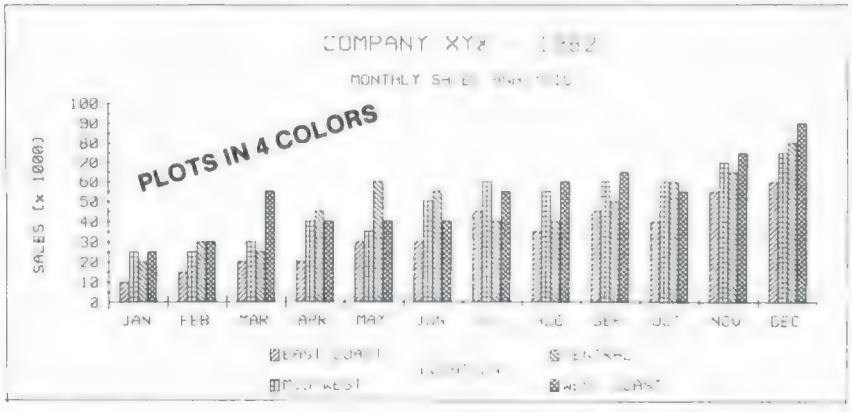

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Plessey which is a binary code consisting of four bars and the adjacent four spaces. The version RS uses is called MSI code. The MSI code consists of a start character, seven data characters, a four-bit check character, a termination bar, and a reverse start character. It is primarily used in large commercial applications to mark containers for inventory.

The hook-up of the bar code reader or wand is very simple. A little black plastic cover on the left side toward the rear of the computer and marked BCR is gently pried off and the 9-pin plug of the bar code reader is inserted. After the computer is turned on and the push-to-read switch is pressed, a red LED in the tip should light. If it doesn't light or stays on when the switch is released, then the connection should be checked. If you haven't purchased the AC adapter for the Model 100 then heed what the manual says — the batteries will be used quite fast. To use the wand, the switch does have to remain pressed during the reading scan. To properly use the wand, you need some practice time, maybe 20 to 30 minutes; however, I think that can be speeded-up if you forget about the sample codes in the book. If you are planning to use the UPC, go to the kitchen and find some un-beat-up cereal boxes or other boxes. They read a lot easier than the manual examples. The wand must be slightly tilted and moved a lot faster than yo would think across the coded area. At first I had a difficult time because I moved too slow. I finally wrote a short program to beep every second and then with a ruler laid out a 20-inch track to follow. When you move the wand about 20 inches in one second you have close to the ideal speed, and it's quite a bit faster than you think the wand could possibly read. The wand does require periodic cleaning of the tip hole to remove foreign particles. The manual points out that the plastic tip may wear and have to be replaced.

The two programs in the Appendix, *INVCRE.BA* and *INVENT.BA* are excellent sample programs which introduce you to the expected use of the bar code reader — the collection of inventory data. Both programs are also on the cassette. *INVCRE.BA* allows you to create an inventory file while *INVENT-BA* allows the data to be collected, tabulated, and printed. Both programs are listed and a line by line comment section follows.

Industry is rapidly moving into the computer age, especially in the area of reading codes of supplies that are used eventually by robotics. A recent announcement by a major auto manufacturer indicates that all their supplies will be bar coded using the 3 of 9 code and in man code. You may even see sometime soon in *PCM*, programs written in bar code. If you have yet to explore this area of your computer, I recommend you take a closer look at this powerful and interesting feature of the Model 100. It's a good bargain for the price and fully supported by Radio Shack.

(Radio Shack, Fort Worth, TX 76102, $99.95)

— Vincent Lord

SOFTWARE

PortaTax — Small Solutions For A *Big* Problem

In a little over a month, Uncle Sam will get bogged down in a mammoth amount of paper, provided you file your tax returns. If you need help in doing the calculations, then Skyline Marketing Corp. has the big answer.

PortaTax is intended as a planning tool which will help the user in determining the various methods and the information needed to fiqure which tax forms to consider, i.e. income averaging, self-employment tax, minimum tax. Skyline provides all the software to get a handle on your taxes in a 24K and a 32K cassette version and a 15 page manual.

The software uses about 18K of memory when first loaded, and depending on how much data is entered, could easily use all the available memory in a 24K system. There are small differences between the two versions: the 32K version allows the whole tax printout to be stored as a text file in memory. The output from both programs is directed to the printer. Only the 32K version allows you to see it on the screen after it is saved as text.

The documentation is somewhat incomplete in that though the program is menu driven, you do not know what information is yet to come. A brief listing of all the categories would be most helpful. The instructions for loading the software are on the last page.

The program is menu driven and has six subprograms:

Filing status
Income
Adjustments to income
Keogh plans
Deductions
Tax calculations

Each section runs separately except the tax calculation must be done last. I took last year's tax forms (which were filed by my CPA), and proceeded to fill in all the blanks. Once I found all the categories and under which subheading they were, things went smoothly. A couple of pass throughs using the enter key allowed me to edit the wrong figures I entered the first time. When the tax calculation function key is pressed, well, the information was processed very quickly and printed out to the printer in a nice 40 cloumn format. I had a nice heading with the date and time, a listing of all my and my wife's income, including interest and dividend, farm, business, capital gains, and other income. Next the adjustments were printed, including moving expenses, IRAs, alimony, etc.

The deductions followed with all the categories listed in the form. Then came some calculated values — capital gains and losses, Keogh contribution, taxable dividends (after exclusions), medical deduction expense, casualty losses, and the two wage earners adjustment.

The bottom line is how much tax. *PortaTax* will compute taxes based upon several methods including income averaging, self-employment, single, married filing jointly, married filing separately, head of household, or qualified widow. All the tax tables are included in the software.

PortaTax is recommended for those who want to know where they stand tax wise. Of course this software is not intended to prepare actual tax returns or to be used as an alternative to sound tax advice. With improvement in the manual, this program would be one of the best tax guides available. Updates are available for a small fee.

(PortaTax, Skyline Marketing Corp., 4510 W. Irving Park Rd., Chicago, IL 60641, $99.95 plus $2 S/H)

—Willis Rollins

SOFTWARE

Tax 'Book' A Bargain System

If you're a professional, or operate a small business, you recognize the pain associated with filling out a half-dozen or more tax forms each year for the IRS. Depreciation and investment credit forms aside, Form 1040 Schedule C — Profit or Loss from Business or Profession (Sole Proprietorship) — is the place where you explain what happened during the year. All income and expenses, as well as the bottom line (total profit or loss), are shown here.

Many of us, unfortunately, are not particularly adept at bookkeeping. The period from January 1 through April 15 is often spent rummaging through stacks of receipts and deciding which of the 30 deduction lines each expense should be recorded on. *BOOK* forces users to be accurate record keepers. Each expense must be assigned to a specific deduction category before it can be entered. Also, since a running total is kept, it only takes a few moments to determine if you're currently operating in the red or black.

BOOK is completely menu-driven. The main menu allows you to print a report (detailed or summary) or enter data. Each data element consists of the date of transaction, a brief description, whether the sale or purchase involved multiple items, and the dollar amount. The current date is the default for the date of transaction and is obtained by pressing ENTER. Multiple units are indicated as 10 @ 1.95, for instance, if you bought or sold 10 mechanical pencils at $1.95 each. If this option is used, the total is automatically carried to the "amount" line.

Each transaction is followed by an "OK Y*/N?" prompt. Pressing ENTER or Y accepts the transaction. In order to keep the amount of BASIC code to a minimum (and conserve precious memory), no editing options were included in the program. Make an error in a transaction or forget to enter an item for a few months and you will have to manually edit the data file. Although some information about how to do this is provided in the 12-page manual, I expect that novice users and non-programmers may be a little leery of tampering with the files.

There are several minor changes that I suggest:

1) Line 8. Change LPRINTTAB(N) to LPRINTTAB(N-1). This will fix the alignment of parentheses around the deductions.
2) Line 16. Change ENTERTAINMENT TO ENTERTAINMNT so the decimals will line up.
3) Line 50. Change FORK=LCTO 66:LPRINT: NEXT to FORK=LC+1TO66:LPRINT:NEXT.
Otherwise, each new page will be one line off. If your printer is capable of performing a form feed, it may be simpler to replace the entire statement by LPRINT CHR$(12).
4) Edit the SBK.DO file so that the date recorded matches the beginning of your fiscal year. Otherwise, all detailed reports will use the date that you first ran the program as the beginning of your year.

If shortage of memory becomes a problem, all data files can be transferred to tape as standard *.DO* files. The printed reports are professional looking and, if you are careful and make no mistakes, the data can be transferred directly to Schedule C at year's end.

Limitations, cosmetic bugs, and a poorly punctuated and edited manual aside, *BOOK* is a bargain at $24.95. if you want to avoid tax-time headache number 437, this may be the program for you.

(Chattanooga Systems Associates, P.O. Box 22261, Chattanooga, TN 37422, $24.95)

— Steven Schwartz

SOFTWARE

Scribe 2.0 — More Printout Power For PoCo

The Model 100 is great for jotting off quick notes and memos. Unfortunately, serious writing is hampered by the machine's inability to format text. The built-in TEXT program lacks the ability to justify, set margins, number pages, etc. *Scribe* 2.0 may be just what you've been waiting for. TEXT — in combination with this updated version of *Scribe* — is the equivalent of many popular word processing programs.

To use *Scribe*, you type your document from within TEXT just as you've always done. Next, enter any special formatting commands at the place in text that they apply. These embedded commands let you: indent text as a block; center text; skip lines; print titles atop each page; start a new page; pause printing so information can be entered from the keyboard (useful for "personalized" form letters; enter non-printing comments; justify text; print in double-wide mode; and enter printer control codes to obtain special print features like italics. Each command is of the form .xxN, where "xx" represents a two-letter command code and "N" is additional information like a number (as in .bm5 for a bottom margin of 5), text (as in .ttANNUAL REPORT — to be used as a title or header for each page), or "on" or "off" to toggle a special feature (as in .ju off which turns off justification).

Other features are selected at print time from within the *Scribe* program. Assuming that your printer supports it, you may print with 10, 12, or 17 characters per inch; use double-strike, emphasis, or both — for letter-quality emulation with a dot-matrix printer; specify data input from a RAM file, cassette, or the keyboard; set the spacing between lines; indicate the beginning page number; use single sheets or continuous forms; and print multiple copies.

Most of the *Scribe* functions perform flawlessly. The only problems that I've encountered so far include the first line of "keyboard only" input printing out of alignment and an occasional centering error. Although the program is sold "as is," the manufacturer has "undertaken to find and fix program bugs and welcomes user suggestions relating to this or other CSA products." By the time you read this, the problems may be corrected.

Scribe is written entirely in BASIC and is open to user modification. If you do not own a Gemini or Epson (default printers), program changes are provided for Okidata and several Radio Shack printers (DMP 120, 200, and 500; Daisy Wheel). If you have a different printer and can find the ASCII codes for its print functions, you should be able to make the changes yourself — only line 1 must be changed.

I have no difficulty recommending *Scribe*. Although it is quite slow — each line of the text file is interpreted and

The Rackseller

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CALIFORNIA	
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Half Moon Bay	Strawflower Electronics
North Hollywood	Levity Distributors
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FLORIDA	
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Also available at selected B.Dalton Bookseller stores in the United States and Canada.

formatted individually prior to printing — considering *Scribe's* power, the inconvenience is minor.

(Chattanooga Systems Associates, P.O. Box 22261, Chattanooga, TN 37422, $24.95, includes 14-page manual and cassette)

— Steven Schwartz

New Products

Print Formatter

Traveling Writer, a new software release from Traveling Software, adds enhanced print formatting capabilities to the Model 100 & NEC PC-8201.

According to the company, the *Traveling Writer* is designed to work with the 100's built-in text processor and uses standard *Wordstar*™ dot commands to provide various text formatting options such as pagination, justification, page headings, tabs, and such printer controls as boldface and italics.

The program allows the user to print mailing labels and personalized boilerplate letters. In addition to name, address, and company, each document can also include up to 10 other items.

The *Traveling Writer* also includes the *Traveling Data Manager* which allows for the selection, sorting, summarizing and merging of information to be used with the *Writer*.

For more information, contact Traveling Software, Inc., 11050 Fifth Avenue NE, Seattle, Washington 98125; (206) 367-8090.

LCD Calendar

The *Time Machine*, from EVS Engineering, will print a full monthly calendar on the Model 100's screen for any year between 100 A.D. and 1,000,000 A.D. The program will also detect leap years and adjust its calendar for February 29th. The month's appointments are shown with arrows next to the date and the current date is bracketed. The current time is also displayed with the monthly calendar and the day's appointments are in a 12 hour a.m./p.m. format.

The current day's appointments are sorted by time of day and displayed on the screen with a single keystroke. The *Time Machine* is $29.95 plus $2 shipping and handling.

EVS Engineering is at 9528 Suite 35, Miramar Road, San Diego, California 92126. Their phone is (619) 695-1385.

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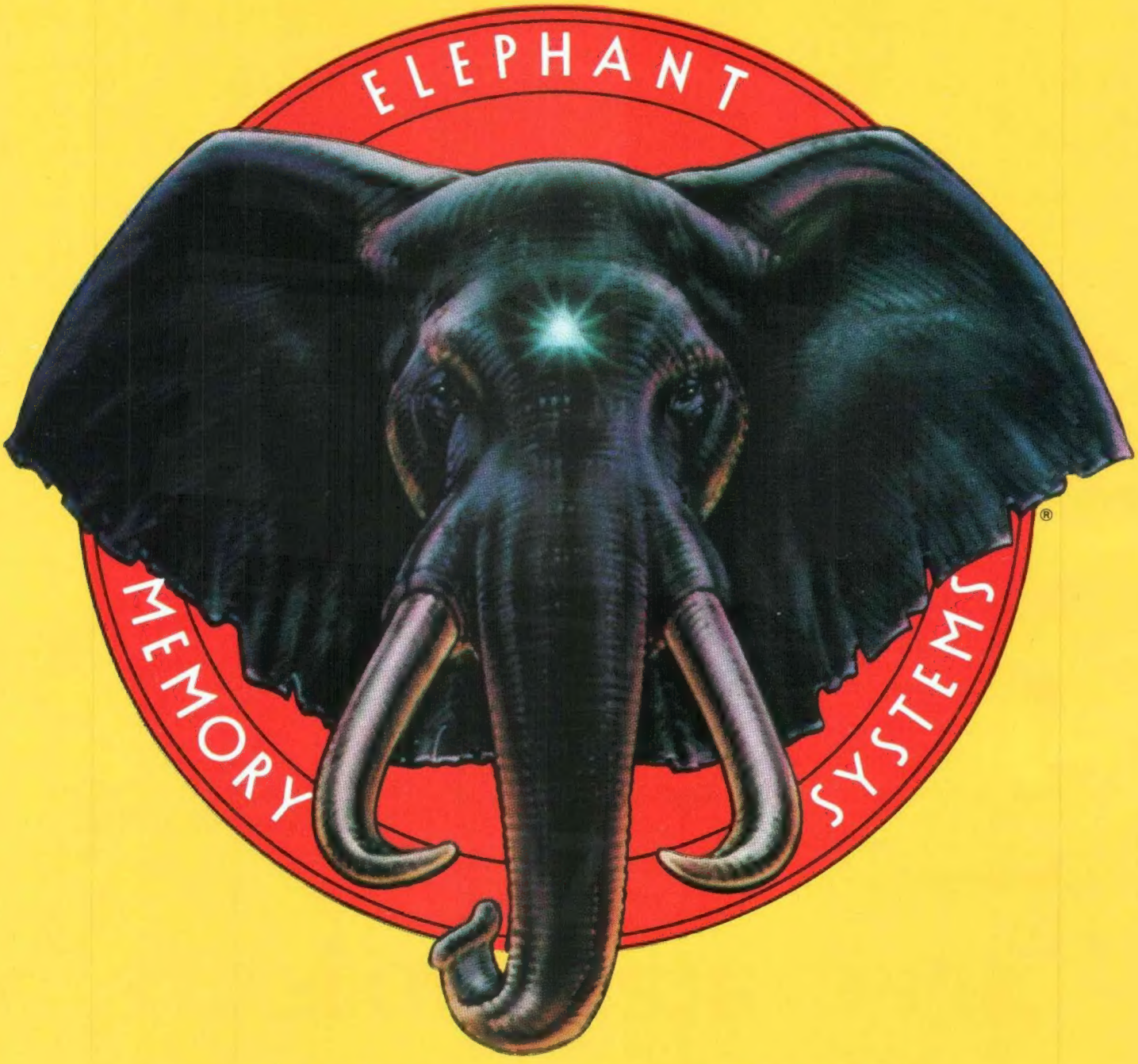

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